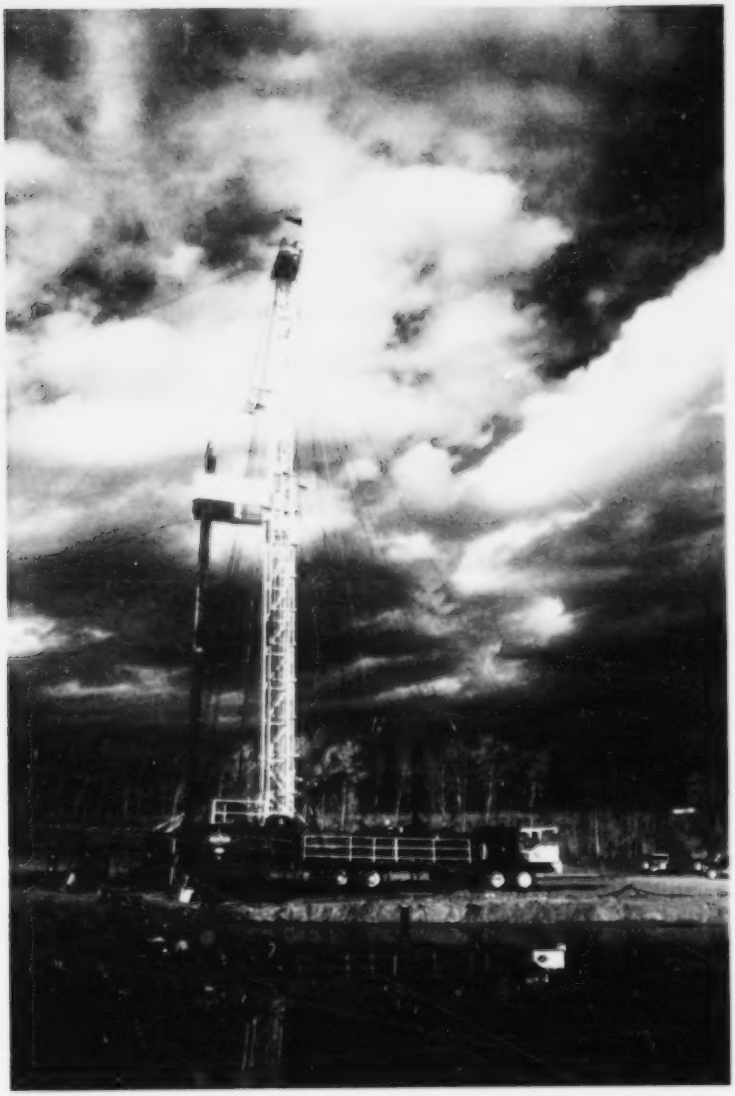
Statistical Series (ST) **2004-57**

EUB

Field Surveillance Provincial Summary

January-December 2003



Alberta Energy and Utilities Board

ALBERTA ENERGY AND UTILITIES BOARD
Statistical Series (ST) 2004-57: Field Surveillance Provincial Summary, January-December 2003

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Executive Summary

The EUB oversees the safe, responsible development of Alberta's energy resources. To ensure that energy projects are constructed and operated safely, the Field Surveillance Branch annually inspects a portion of Alberta's 180 000 operating wells, 16 500 oil batteries and associated satellites, 733 gas plants, 8365 gas batteries, and over 330 000 kilometres of pipelines. EUB field staff enforce standards and conditions set out in licences, approvals, and EUB regulations and requirements using a prioritized inspection system referred to as OSI, which is based on *o*perator performance, *s*ensitivity of the location and *i*nherent risk of the operation.

Operating out of eight EUB Field Centres throughout Alberta, field staff inspect construction, operation, and abandonment operations at oil, gas, and oil sands facilities (including pipelines, compressors, and processing plants). They respond to emergencies and public complaints on a 24-hour basis and ensure a consistent approach to enforcement of requirements with noncompliant operators.

The Field Surveillance Branch also spends considerable time facilitating the resolution of landowner-industry conflicts and participating in public-industry liaison committees in an effort to reach mutually agreeable solutions between landowners and energy companies.

In the year ahead, Field Surveillance staff will continue to focus on pipeline corrosion, noncompliant licensees, air monitoring activities, facilitation, reduction of odours, and improving communication with synergy groups and other communities throughout the province.

Inspections

The percentage of satisfactory inspections increased to 71.5 per cent in 2003 from 70.6 per cent in 2002. The minor unsatisfactory inspection percentage remained constant at 25 per cent, while the overall percentage of major unsatisfactory inspections decreased from 3.9 per cent in 2002 to 3.0 per cent in 2003, about a 25 per cent improvement.

Enforcement

The EUB is confident that most Alberta energy industry operators strive to comply with EUB regulations, requirements, and programs. However, companies that fail to meet requirements or follow EUB direction are subject to escalating enforcement consequences. Enforcement actions always include deadlines for fixing a problem and may be reinforced by penalties, such as temporary or long-term suspension of operations.

In 2003, the EUB needed to suspend 110 facilities from operation until the problem was rectified, compared to 128 in 2002, a 14 per cent decrease. The cost to industry of suspensions also decreased, to $10.2 million, versus $25.8 million in 2002 (see Table 2).

Well Control Occurrences

Drilling and servicing in Alberta over the last five years have been extremely active, with over 70 000 wells drilled. This has resulted in many challenges for both industry and the EUB to ensure the drilling and servicing of wells safely with minimal impact to the environment and public.

Blows and blowouts during drilling and servicing operations are among the most serious incidents for well operations and have the potential to cause public safety and environmental impacts. The EUB regards the number of blows, blowouts, and kicks* as a primary indicator of industry's drilling and servicing performance and pays particularly close attention to industry's response to these incidents.

Requirements for high training standards and sophisticated blowout detection and prevention equipment have helped to keep well control occurrences to a minimum. Of the 17 108 wells drilled in 2003, the EUB recorded

- 1 blowout and 3 blows during drilling, compared to 6 blowouts and 0 blows in 2002, and
- 4 blowouts and 7 blows during servicing, versus 5 blowouts and 2 blows in 2002.

All were brought under control with minimal environmental damage and no public safety impacts. The EUB will continue to review all blows and blowouts related to drilling and servicing operations to identify changes to equipment, procedures, and regulations that may be required to reduce drilling and servicing blows and blowouts.

The 106 kicks recorded in 2003 equate to a kick occurrence rate of approximately 6 kicks per 1000 wells drilled. The kick occurrence rate has remained relatively constant for the last five years and is a significant improvement from the years prior to 1997/1998, when the rate averaged 23 kicks per 1000 wells drilled.

Gas Production

There were 1766 inspections completed on gas processing facilities in 2003, including 15 operational audits. This was a decrease in inspections compared to the 2 170 inspections conducted in 2002 (see Figure 15).

The major unsatisfactory inspection percentage on gas plants and batteries decreased to 1.6 per cent in 2003 from 2.3 per cent in 2002, a 30% improvement. The improved compliance can be attributed to industry's improved understanding of EUB requirements, self audits, operator awareness sessions and presentations by EUB staff.

Pipelines

Corrosion continues to be the main cause of pipeline failures, and staff investigate 100 per cent of corrosion failures. While not all corrosion failures are physically inspected, EUB staff follow up on all failures through an investigation into the incident. Internal corrosion failures decreased to 350 in 2003 from 447 in 2002, a 21.7 per cent decrease. In addition, external corrosion failures decreased to 86 in 2003 from 116 in 2002, a 25.9 per cent decrease. These significant decreases are attributed to failure mechanisms being investigated and mitigation measures implemented by licensees. EUB field staff conducted a total of 468 inspections on pipeline failure/hits in 2003, compared to 516 last year.

In 2003, there were 451 satisfactory inspections, 4 minor unsatisfactory inspections, 12 major unsatisfactory inspections, and 1 serious unsatisfactory inspection. This compared

*Blows are the unexpected release of wellbore fluids into the atmosphere, while blowouts are the complete loss of control of the flow of fluids from a well. During drilling operations, any unexpected entry of water, gas, oil, or other formation fluid into a wellbore, that is under control and can be circulated out, is called a kick.

to 516 inspections in 2002, when there were 456 satisfactory inspections, 14 minor unsatisfactory inspections, 46 major unsatisfactory inspections, and no serious unsatisfactory inspections.

The significant decrease in major unsatisfactory inspections of some 74 per cent is attributed to the implementation of *Guide 66: Pipeline Inspection Manual*, which details EUB requirements and enforcement action when a noncompliance occurs.

EUB field staff conducted 439 pipeline construction/test inspections in 2003, of which 405 were satisfactory (92.3 per cent of total, up from 283, or 85.8 per cent, in 2002), 25 were minor unsatisfactory (5.7 per cent, down from 40, or 12.1 per cent, in 2002), and 8 were major unsatisfactory (essentially unchanged from 2002), with 1 serious unsatisfactory inspection.

Spills

A total of 1381 spills were reported to EUB Field Centres in 2003, a decrease of 4.4 per cent from 1445 in 2002. Of the 1381 spills:

- 57 were priority 1—greatest potential for environmental and/or public impacts (4.1 per cent),
- 264 were priority 2—significant volume of product released or the potential for environmental impacts (19.1 per cent), and
- 1060 were priority 3—low or medium volumes (76.8 per cent).

It is important to note that more than three-quarters of all spills were low volume and were usually contained on lease. Inspections were conducted on 506 spills. There were 474 satisfactory spill inspections, 12 minor unsatisfactory spill inspections, 20 major unsatisfactory inspections, and no serious unsatisfactory inspections. This compares to 631 inspections conducted last year, when 23 minor unsatisfactory spill inspections, 14 major unsatisfactory spill inspections, and no serious unsatisfactory spill inspections were identified. Spill volumes of hydrocarbon and produced water in 2003 were 5268.3 cubic metres and 15 605 cubic metres respectively. This is an increase in hydrocarbon volume from 5188.8 cubic metres in 2002 and a decrease in produced water spilled from 19 164 cubic metres in 2002.

Air Monitoring

In 2003, the EUB's two mobile air monitoring units conducted a total of 695 inspections, compared with 461 the previous year. The percentage of unsatisfactory inspections decreased from 8.7 per cent in 2002 to 4.7 per cent in 2003, a 47 per cent improvement. Industry continues to improve its compliance record with respect to reducing emissions from oil and gas facilities. The leading sources of emissions were leaking tank hatches, tank truck loading and unloading, and inadequate maintenance.

Waste Management Facilities

In 2003, field staff inspected 72 waste management facilities, which resulted in 4 major and 1 serious unsatisfactory inspections. This compares to 65 waste management inspections conducted in 2002, resulting in 6 major unsatisfactory inspections. Off-lease

odours, failure to meet *Guide 55* storage requirements, and staining/spillage were the most common deficiencies identified.

Responding to Public Concerns

Field Surveillance staff respond to all complaints within our jurisdiction, with the focus on ensuring prompt, effective, and lasting resolution of any problem identified.

In 2003, the EUB received and responded to 817 public complaints, compared to 869 in 2002, a decrease of 6 per cent. Since a number of complaints involved more than one concern, the EUB identified 921 issues associated with the 817 complaints, compared to 1019 issues in 2002. Last year, 88 per cent of individuals surveyed were satisfied with the response from the EUB, compared to 91 per cent in 2002.

Public Involvement

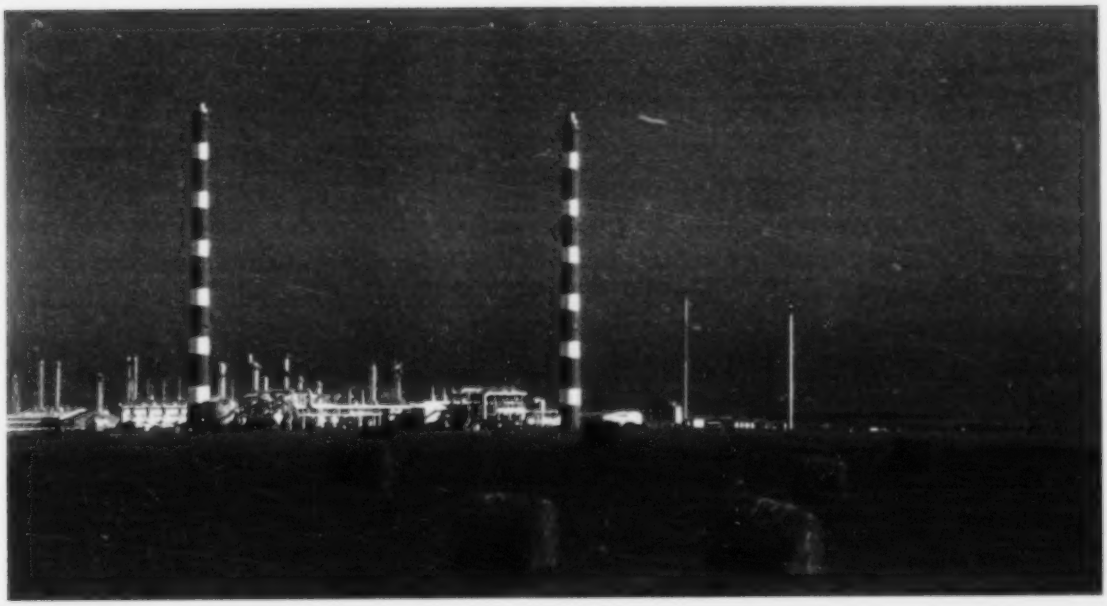
In 2003, field staff were involved with 169 facilitations, of which 127 were completed and 94 were successfully resolved. Fourteen of the remaining 33 files proceeded to mediation through the EUB's Appropriate Dispute Resolution program, of which 9 were successfully resolved and 1 required a hearing. For the remaining 19 files, 12 applications are either on hold or have been withdrawn by the applicant and 7 required or are in the process of going to hearing.

Synergy groups are another effective means of identifying and addressing issues. These groups are usually made up of public, industry, and government representatives. The size, structure, and membership of a synergy group depends on factors such as population, production type, industry activity, geographical location, and sensitivity of an area. EUB field staff participate in most of these groups and strongly endorse this cooperative approach as an effective way to improve communication and identify and address issues.

Public Safety and Sour Gas

In January 2000, the EUB established a 22-member multistakeholder Advisory Committee on Public Safety and Sour Gas to review Alberta's sour gas regulatory system. The committee made a report of 87 recommendations, 12 of which specifically related to the Field Surveillance Branch's role.

As part of Recommendation #82, Field Surveillance staff have initiated meetings with over 50 aboriginal communities and groups since 2001. In 2004, the remaining communities and groups will be contacted. All issues under EUB jurisdiction have been addressed or are under way. Communication between the EUB, aboriginal people, and industry has improved as a result. Enhanced relationships and improved communication will continue in 2004 and beyond.



1 Summary of Inspection Activity, Enforcement Action, Public Complaint Statistics, Stakeholder Involvement Efforts, and Major Initiatives

1.1 Introduction

This *Provincial Summary* report provides readers with information and statistics related to the activities of the Alberta Energy and Utilities Board (EUB/Board) Field Surveillance Branch. Data are analyzed to predict trends that help Field Surveillance allocate resources more efficiently and determine future actions to improve industry's understanding of and compliance with EUB requirements.

The EUB Field Surveillance Branch has eight Field Centres located throughout the province. A suboffice of the Grande Prairie Field Centre is located in High Level. (See Figure 1.) In addition, the EUB has a regional office located in Fort McMurray responsible for oil sands development, mining, and processing.

1.2 Role of Field Surveillance Staff

Field staff have three primary goals, as part of the EUB's overall surveillance and enforcement role.

1) **Licensee/Operator Field Performance**: Reduce potential environmental and public safety impacts from oil and gas activity by

   - inspecting drilling and service rigs, oil and gas production facilities, and pipelines to ensure that licensees are in compliance with all applicable standards, specifications, and approval conditions;

   - focusing inspection activities on higher-risk facilities, such as sour gas wells, pipelines, and facilities located near environmentally sensitive locations;

Figure 1. EUB Field Centre boundaries

- focusing on problem licensees with poor inspection records, with the goal of long-term improvements; and
- taking appropriate enforcement action when noncompliance occurs.

2) **Incident Response**: Timely and effective response to minimize the effects on the public and environment from incidents related to the oil and gas industry by

- responding to oil and gas emergencies;
- responding to and addressing complaints related to energy development and environmental issues; and
- monitoring the cleanup of oil and saltwater spills.

3) **Frontline Stakeholder Understanding and Awareness**: Improve existing compliance rates by increasing industry's understanding of EUB requirements and increasing the public's understanding of the EUB and its services by

- attending meetings with the public and licensees to assist in resolving issues;
- participating in community meetings to answer questions and provide information about the EUB's regulatory process;

- educating industry on new and revised requirements; and
- meeting with local authorities, communities, and synergy groups and explaining the EUB's roles and responsibilities.

The following sections summarize Field Surveillance Branch inspections, enforcement, public complaints, stakeholder involvement activities, and other key initiatives.

1.3 Inspections

The Field Surveillance Branch continues to prioritize its inspection activities based on the weighting of three key criteria—*operator* (licensee/contractor) history, site *sensitivity*, and *inherent* risk (OSI)—with respect to the facility/operation. Field staff focus on licensees with previous unsatisfactory inspections, including those with repeat noncompliance. Sensitivity is determined by whether the facility is in a forested or agricultural area, with an increased inspection emphasis on areas with high numbers of public complaints and high frequency of environmental incidents. The inherent risk of a facility or operation is determined by reviewing specific technical details about the facility, such as the complexity of the operation and whether the facility is sweet or sour.

The total number of initial field inspections decreased slightly, from 8255 in 2002 to 7910 in 2003, due to increased demands in the areas of community and aboriginal relations work, air monitoring activities, implementation of Public Safety and Sour Gas initiatives (see Section 1.7.1), and the implementation of the Field Inspection System initiative (see Section 1.7.2). The percentage of satisfactory inspections increased from 70.6 per cent in 2002 to 71.5 per cent in 2003. The minor unsatisfactory inspection percentage remained constant at 25 per cent. However, the overall percentage of major unsatisfactory inspections decreased from 3.9 per cent in 2002 to 3.0 per cent in 2003. There were 7 serious unsatisfactory inspections in 2003 compared to 1 in 2002.

EUB Action

- Field Surveillance staff will continue to focus on pipeline corrosion, noncompliant licensees, air monitoring activities, facilitation,[1] reduction of odours, and improving communication with synergy groups[2] and communities throughout the province.

Throughout this report, the terms "satisfactory" inspection and "minor," "major," and "serious" unsatisfactory inspections are used. It is important that the definition of each is understood to properly interpret the statistics. There are numerous requirements in each inspection discipline, and even if one noncompliance item is identified, the inspection is considered unsatisfactory. The definitions below include those for a minor, major, and serious unsatisfactory event/inspection from *Informational Letter (IL) 99-4: EUB*

[1] When members of the public have concerns about a particular industry project and the parties are having difficulty resolving issues on their own, Field Surveillance staff facilitate the resolution process. They assist to improve communications, information sharing, and identification of issues and options available and to ensure that EUB requirements are understood.

[2] To ensure that the impact of resource development and operations is minimized on an ongoing and proactive basis, synergy groups are formed to identify issues and work on collaborative solutions to the problems identified. Synergy groups usually involve public, industry, and appropriate government representatives. EUB staff assist and support the organization of these groups, but the strength and success of the groups lie in the direct involvement of participants.

Enforcement Process, Generic Enforcement Ladder, and Field Surveillance Enforcement Ladder and apply to these terms throughout this report:

- **satisfactory event/inspection**—an inspection where an licensee is found in compliance with all regulations/requirements

- **minor unsatisfactory event/inspection**—a contravention of regulation(s)/requirement(s) is found that does not result in a direct threat to the public and/or the environment and does not adversely affect oil and gas operations

  Examples of minor unsatisfactory inspection items are
  - pipeline signage missing, defaced, or displaying incorrect information,
  - garbage and debris not stored in a reasonable manner at an oil or gas facility, and
  - meter calibrations not completed at an oil and gas facility.

- **major unsatisfactory event/inspection**—a contravention of regulation(s)/requirement(s) is found that the licensee has failed to address and/or that has the potential to cause an adverse impact on the public and/or the environment

  Examples of major unsatisfactory inspection items are
  - failure of blowout prevention (BOP) equipment on a drilling or service rig,
  - hydrogen sulphide (H_2S) release causing odours off lease at an oil battery, and
  - not properly informing stakeholders of proposed development and/or application, as per *Guide 56: Energy Development Application Guide and Schedules*.

- **serious unsatisfactory event/inspection**—a total disregard for regulation(s)/requirement(s) is found that is causing or may cause a significant impact on the public and/or environment or an instance of fraud is found

  Examples of serious unsatisfactory inspection items are
  - conducting an activity without an approval where an approval is required,
  - unaddressed release into water when the licensee was aware but took no action, and
  - blowout prevention equipment missing where required on a drilling or service rig.

Table 1 summarizes the field inspections that occurred in 2003 and includes the number of initial[3] inspections and reinspections[4] in each category. Each inspection category includes the number of satisfactory, minor, major, and serious unsatisfactory inspections.

1.4 Enforcement

The Field Surveillance Branch use the process detailed in *IL 99-4* to ensure that a firm, fair, and consistent approach is taken in all noncompliance situations. Enforcement actions escalate to a higher level if a licensee repeatedly fails to meet EUB requirements. The enforcement process has

- improved EUB staff consistency, efficiency, and effectiveness,

[3] An initial inspection is the first inspection on a facility in a designated time period.
[4] A reinspection is a follow-up to a deficiency found at a facility during the initial inspection.

Table 1. Field inspections, 2003[1]

	Initial	Satisfactory	Minor unsatisfactory	Major unsatisfactory	Serious unsatisfactory	Reinspection
Drilling rigs	400	354	30	14	2	0
Service rigs	223	202	19	2	0	0
Oil production facilities	3 483	2 228	1 177	77	1	1 261
Gas production facilities	1 766	1 181	557	28	0	584
Pipeline construction/ testing	439	405	25	8	1	19
Pipeline failure inspections	468	451	4	12	1	70
Pipeline operations inspections	421	256	148	17	0	140
Pipeline contact damage inspections	68	30	1	36	1	34
Spill inspections	506	474	12	20	0	0
Waste management facilities	72	36	31	4	1	4
Drilling waste management						
-Nonroutine inspections	12	8	3	1	0	4
-Routine inspections	52	30	4	18	0	0
TOTAL	7 910	5 655	2 011	237	7	2 116

[1] For definitions of minor, major, and serious unsatisfactory inspections, see Section 1.3. Note that details for each inspection category are found in various sections throughout this report.

- increased public safety, minimized environmental impact, and improved conservation,
- created a level regulatory playing field for industry, and
- improved industry accountability and the overall compliance rate.

Licensees that do not comply with the requirements or fail to follow EUB direction are subject to escalating enforcement consequences. A licensee's required response to EUB direction and subsequent continued compliance with regulations will result in its compliance status reverting back to satisfactory.

Table 2 summarizes the oil and gas operations that were shut down in 2003 as a direct result of EUB enforcement action and gives the estimated cost to industry (also see Figure 2).

1.5 Public Complaints

1.5.1 EUB Response to Public Complaints

Energy exploration and development activity continued at a record pace in 2003. The EUB recognizes that with this high activity level there will be associated public concerns, and responding to and effectively addressing concerns is a high priority of field staff.

Field staff respond to all complaints related to upstream oil and gas exploration, production, and disposition activities, with the goal of ensuring prompt, effective, and lasting resolution to problems identified. When a public complaint is received that is not within the EUB's jurisdiction, the individual with the complaint is promptly directed to the appropriate government agency so the matter can be addressed.

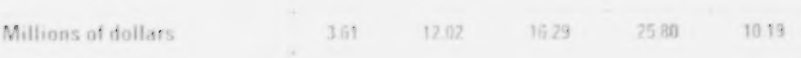
Table 2. Facilities/operations shut down at EUB Field Surveillance request, January 1 to December 31, 2003

Type	Approximate number of suspensions	Average duration of shutdown	Estimated deferred cash flow[1] ($)	Estimated cost ($)	Most common reasons for suspensions
Drilling rigs	11	10.6 hours		87 750	• Operational failure of BOP/accumulator system • Crew training
Service rigs	2	6.0 hours		3600	• Operational failure of BOP/accumulator system
Oil production batteries	16	28 days	2 665 250		• H_2S emissions • Spills
Gas facilities	9	9 days	76 000		• No dike where required • Unaddressed spill
Pipelines under construction	7	5 days	N/A	210 000	• Ground disturbance activities
Pipelines in operation	64	20 days	2 400 000	1 000 000	• Corrosion integrity work
Waste management facility	1	8.5 months	3 750 000		• Unapproved facility • Inadequate waste storage
Subtotal			8 891 250	1 301 350	
TOTAL	**110**		**10 192 600**		

[1] Compiled using data from EUB Field Centres. Where direct estimates were not available from the involved licensees, cost estimates were as follows: $750/hour for drilling rig time, $300/hour for service rig time, $250/m³ for value of conventional bitumen oil production, $170.10/m³ for value of gas production, and $250/hour for pipeline construction down time. Costs of suspensions are as supplied by industry where available. Where necessary, costs were calculated using production reports.

Figure 2

Estimated deferred cash flow and cost due to shutdowns at EUB Field Surveillance request



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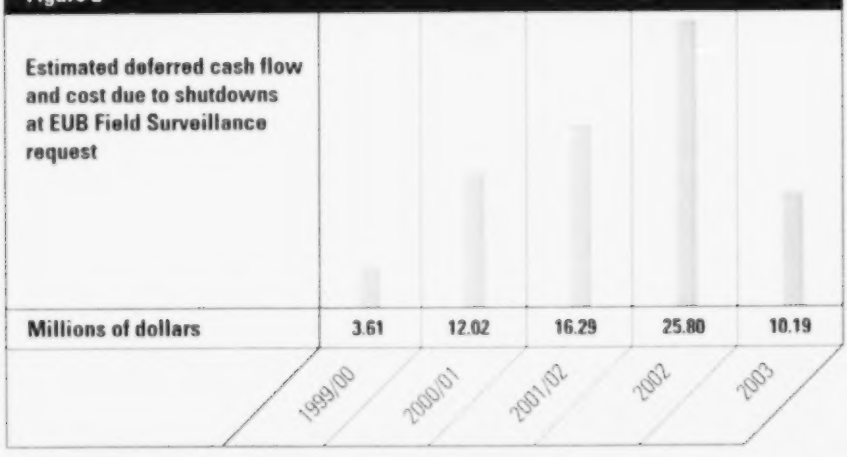
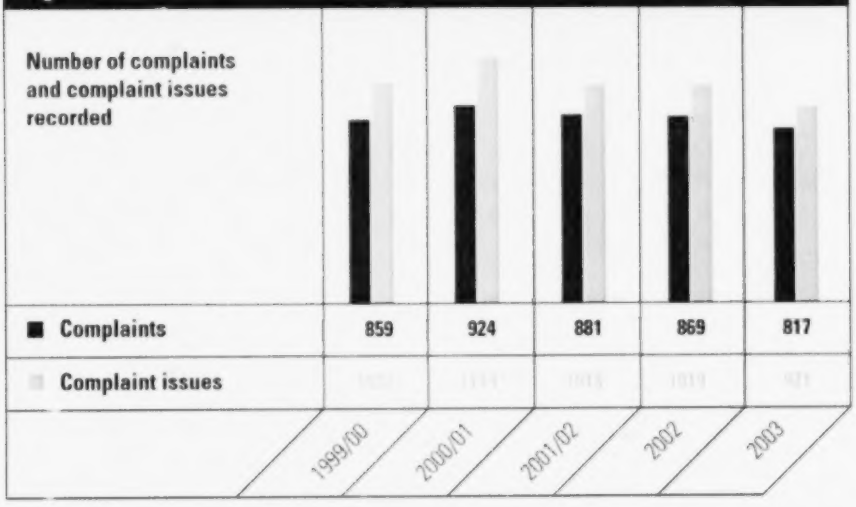


In 2003, the EUB received and responded to 817 public complaints, compared to 869 in 2002. Since some complaints recorded more than one concern, the EUB identified 921 issues associated with the 817 complaints, compared to 1019 issues the previous year (see Figure 3).

Figure 3



The number of public complaints has decreased for the fourth consecutive year. We believe that part of the decrease is due to the EUB's efforts in facilitation and communication, increased involvement with synergy groups, and industry's continued improvement in its compliance.

EUB Action

- Although there was a decrease in the number of public complaints received, the EUB will continue to emphasize the benefits and importance to industry of proactive and continual communication with the public.

1.5.2 Complaint Follow-up

In an effort to gauge the level of satisfaction with both EUB and industry responses, Field Surveillance conducts a random complaint call-back program. The information gathered is analyzed to ensure that appropriate complaint response procedures are being used by the EUB and industry.

Results of the 2003 Complaint Call-Back Survey indicate that

- 58 per cent of individuals contacted said their concerns were satisfactorily resolved, compared to 64 per cent in 2002;
- 53 per cent of the individuals surveyed were satisfied with the licensee response, compared to 56 per cent in 2002; and
- 88 per cent of the individuals surveyed were satisfied with the response from the EUB, compared to 91 per cent in 2002.

EUB Action

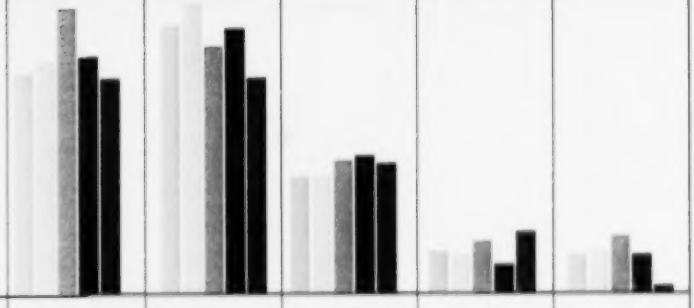
- In 2004, the EUB will continue to target 300 complaints for follow-up to gauge whether the EUB is responding effectively to the public.

1.5.3 Types of Public Complaints

The EUB receives complaints from the upstream petroleum industry on a variety of issues. Four of the most common concerns are operational impact (noise, fire, flare, smoke, spill, nuisance fire), physical impact (lease management, property damage, public hazard, water well), odours (H_2S, sulphur dioxide [SO_2], total hydrocarbon content [THC], other), and health (human and animal) (see Figure 4). Odour complaints represented 34 per cent of all public complaints received by the EUB in 2003.

Figure 4

Distribution of complaints by most common concerns

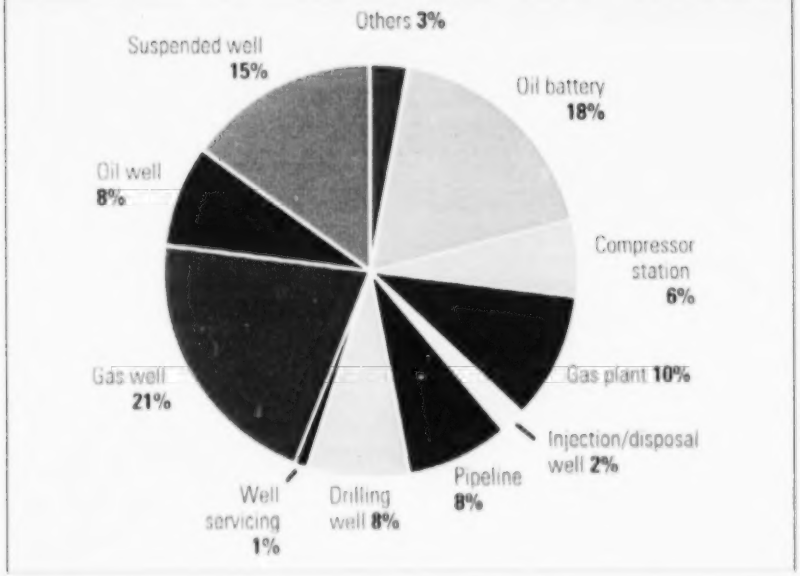


	Operational impact	Odours	Physical impact	Health	Miscellaneous
1999	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
2001	317	360	195	78	85
2002	349	387	201	44	56
2003	319	314	190	90	12

Although there was a significant increase in the activity level in the oil and gas industry, the number of public complaints received by the EUB decreased by 6 per cent compared to the previous year. The reduction can be attributed to several factors, such as increased air monitoring surveillance, enhanced interaction between the public and industry through public meetings and synergy group participation, and educational presentations.

Analysis of data indicates that gas wells and oil batteries were the largest source of public complaints, at 39 per cent (see Figure 5).

Figure 5. Public complaints by source, 2003



EUB Action

- Throughout the year, presentations are made to industry outlining the most common sources and causes of public complaints and describing measures required to reduce them. This proactive communication with industry groups and associations and during licensee awareness sessions will continue in 2004. In addition, Field Surveillance staff will continue holding awareness sessions with licensees in sour areas of the province in a continuing effort to reduce transient H_2S emissions.

1.6 Stakeholder Involvement Activities

1.6.1 Facilitation Efforts

Industry has a responsibility to discuss proposed development projects with citizens in the area and identify and address concerns, with limited EUB staff involvement. When issues or concerns arise that have not been resolved satisfactorily, EUB field staff are available to provide guidance and assistance to both parties to

- identify concerns regarding the proposed development,
- assist the public in understanding what the EUB requirements of industry are,
- facilitate the discussion of possible solutions,
- assist the public in understanding the EUB's mandate, and
- ensure understanding of the EUB's Appropriate Dispute Resolution (ADR) program and hearing process, which are available to both parties.

Field staff were involved with 169 facilitations in 2003, of which 127 were completed and 94 were successfully resolved. Fourteen of the remaining 33 files proceeded to mediation through the EUB's ADR program, of which 9 were successfully resolved, 1 went to hearing, and 4 were ongoing. Of the remaining 19 files, 7 were dismissed or withdrawn, 5 went or were in the process of going to hearing, and 7 were ongoing. This compares to 198 facilitations conducted in 2002.

Numerous presentations, meetings, and workshops have taken place to improve stakeholder understanding of the ADR process, which continues to prove very effective in assisting industry and the public in resolving issues.

EUB Action

- A detailed analysis of the EUB's facilitation role will be conducted in 2004 and improvements will be made, if required, to ensure the ongoing effectiveness of the program.

1.6.2 Synergy Groups

Synergy groups are another effective means of identifying and addressing issues. These groups are usually made up of public, industry, and government representatives. The size, structure, and membership of a synergy group depends on factors such as population, production type, industry activity, geographical location, and sensitivity of an area. EUB field staff participate in most of these groups and strongly endorse this cooperative approach as an effective way to improve communication and identify and address issues. Table 3 lists the 59 active synergy groups located throughout the province.

Cosponsored by synergy groups, the Canadian Association of Petroleum Producers, and the EUB, "Synergy Supporting Synergy" was the second provincial gathering of synergy groups. Nearly 200 people worked towards the development of a collective vision and action plan to move synergy forward. Guided by cooperation, communication, and convergence, participants took a look ten years into the future with their vision and then came back to the present to find a way to make it happen.

Education and communication emerged as common needs and goals. It was decided that a small multistakeholder implementation team would be formed, with the responsibility of developing a framework for a centralized information centre and synergy support system. One of the tasks of the implementation team will be to expand and improve access to an existing database to promote learning and sharing among groups. The team will also examine better ways to identify and resolve problems and share ideas and best practices. In addition, the team will develop participation skills and leadership at the local level to promote synergy in new and existing arenas. All roundtable participants and other interested parties will be kept informed on a regular basis of the progress of the implementation team, with another provincial gathering taking place as the team concludes its work.

EUB Action

- The EUB surveyed synergy groups throughout the province and has established a database of information. This database is being expanded in 2004 to ensure improved communication between the EUB and synergy groups.

Table 3. Active synergy groups in Alberta

Bonnyville Field Centre
- Alberta Utility Location and Coordination Council
- Bonnyville Oil Producers Trucking Committee
- Cumulative Effects Monitoring Association (CEMA)
- Lakeland Industry & Community Association (LICA)
- Marie Lake Landowners Association
- Muriel Lake Basin Management Society
- Sask-Alta Waste Disposal Coop (SAWDC)
- Stop and Tell Our Politicians (STOP)
- Wood Buffalo Environmental Association

Grande Prairie Field Centre
- Chinchaga Operators Synergy
- Clear Hills Surface Rights Association
- County Industrial Operators Group
- Fourth Creek Group
- Greater Kakwa Area Citizens Group
- Hay/Zama Committee
- Peace Air Shed Zone
- Peace Arch Operators Group
- Rainbow Lake Operators
- Saddle Hills Awareness Group
- SPCA Beaverlodge Crime Prevention
- Valleyview Operators Group
- Western Cree Tribal Council

Medicine Hat Field Centre
- Grassland Naturalists
- Shallow Gas Management Association
- Urban Environment and Recreation Advisory Board

Red Deer Field Centre
- Bashaw Community Advisory Group
- Butte Advisory Committee
- Eagle Valley Community Advisory Group
- Harmattan Elkton Community Advisory Committee
- Olds Community Advisory Group
- Panther Advisory Group (PAG)
- Parkland Airshed Management Zone (PAMZ)
- Sundre Petroleum Operator's Group (SPOG)
- Sunchild/Ochiese Mutual Aid Group (SOMAG)
- West Central Stakeholders Group

Drayton Valley Field Centre
- Edson Creative Solutions
- Forest Resources Advisory Group (FRAG)
- Genesee Synergy Group
- Pembina Area Natural Resources Advisory Committee (PANRAC)
- Rider Pembina Advisory Committee
- West Central Air Shed Society

Midnapore Field Centre
- Cochrane Pipeline Operators Committee
- Indus Community / Petroleum Industry Association
- Quirk Creek Gas Processing Community Committee
- Southwest Alberta Sustainable Community Initiative (SASCI)
- Vulcan County Synergy Group

St. Albert Field Centre
- Alberta Industrial Heartland Association
- East Parkland Liaison Committee (EPLC)
- Edmonton Area Pipeline Utilities Operators Committee (EAPUOC)
- Fort Assiniboine / CBM Synergy Group
- Northeast Central Industrial Association
- Rimbey and Area Multi Stakeholders Group
- Strathcona Neighbor Advisory Panel (SNAP)
- Transportation & Utility Corridor
- Watelet Public/Industry
- Western Canada Cavern Operators Group

Wainwright Field Centre
- Hardisty Terminal Complex Committee
- Lloydminster Area Operators Gas Migration Team (LAOGMT)
- Provost Area Operators

1.7 Major Initiatives

1.7.1 Advisory Committee on Public Safety and Sour Gas

In 2000, the EUB established the Advisory Committee on Public Safety and Sour Gas. The 22-member multistakeholder committee was asked to review the regulatory system for sour gas as it relates to public health and safety. More than 1600 Albertans residing in major sour gas development areas in the province were consulted through public outreach sessions, written submissions, and telephone surveys.

A report was published that contained 87 specific recommendations directed at

- improving the understanding of sour gas,
- improving the regulatory processes under which sour gas development is approved and operates,
- reducing the impact of sour gas on public health and safety, and
- improving the consultation processes with the public on all sour gas matters.

Of the 87 recommendations, EUB Field Surveillance had responsibility for 12 recommendations, which have been completed and incorporated into Field Surveillance business processes. Three recommendations were completed in 2003:

- Recommendation #77 - Make specific information available to the public to assist them in identifying and contacting licensees that are involved in sour gas development in their area.

  Action Taken - A database with all wells, pipelines, and facilities will be posted on the EUB Web site. In addition, the addresses and phone numbers of all licensees and the EUB Field Centre and its phone number will be included in the database. The database will be available to all stakeholders in 2004.

- Recommendation #78 - Develop a database of all existing community groups that address specific issues related to oil and gas activity and identify where new community groups could be established. In addition, licensees will be identified in sour fields to establish mutual aid agreements that develop working relationships and provide one central contact for the public.

  Action Taken - A comprehensive survey was developed and sent to all active community groups. The results were entered onto a database. To date there are 48 community groups in the database. The information on the database is currently being updated and follow-up is being conducted on groups not on the database. Also, meetings have been held with licensees in areas with sour development and currently with no active community group. The purpose of these meetings is to review the requirements, share best practices, encourage mutual aid agreements, and establish one central contact for public concerns.

- Recommendation #82 - Ensure more interaction between EUB, aboriginal people, and industry.

Action Taken – Field Surveillance staff have initiated meetings with over 50 aboriginal communities and groups, beginning in 2001. In 2004, the remaining communities and groups will be contacted. All issues under EUB jurisdiction have been addressed or are in the process of being addressed. Communication between the EUB, aboriginal people, and industry has improved as a result. Enhanced relationships and improved communication will continue in 2004 and beyond.

More detailed information on the Advisory Committee on Public Safety and Sour Gas is available on the EUB's Web site at www.eub.gov.ab.ca.

1.7.2 Field Inspection System

The Field Inspection System (FIS) replaced the EUB's nonintegrated mainframe system. The FIS system was phased in to simplify construction and implementation. FIS comprises three phases:

- Notifications - By the end of 2003, about 85 per cent of industry notifications were made electronically through the system.

- Incidents - Complaints, facilitation, and reportable releases are recorded in a new database environment using an updated program.

- Inspections - Information is captured in real time using handheld computers, GPS, and digital cameras. Industry will be able to access all its EUB inspection information in a more timely manner.

With all phases implemented, most Field Surveillance work will be conducted under the FIS system. Information accuracy should improve and inspections, incidents, and notifications can easily be entered, viewed, and printed. Having all the necessary information in one database provides Field Surveillance staff easy access to information.

1.7.3 Emergency Response Plans

The requirements for emergency response and preparedness have been compiled into *Guide 71*. A draft was circulated to all stakeholders for review and input and the guide was finalized and issued in June 2003. Licensees are expected to be in compliance with all of its requirements. It is the responsibility of each licensee to determine the size of a project's emergency planning zone (EPZ) if there are any surface developments within the EPZ and to determine whether an emergency response plan (ERP) is required.

When field staff inspect a sour well, pipeline, or facility, they determine if the licensee has an ERP or if one is required. When an ERP is required, staff ensure that the licensee is so informed and that an ERP is submitted for approval. If there is an ERP, staff contact two residents within the EPZ to ensure that they are aware of the ERP and that the licensee has reviewed the plan with them.

EUB Action

- An ERP audit protocol will be finalized in 2004. The audit assesses the capability of the licensee to implement its ERP.

1.7.4 Fort McMurray Regional Office

The EUB's new regional office in Fort McMurray is committed to an increased regulatory presence in Alberta's flourishing oil sands industry. As the EUB becomes part of the Fort McMurray community, the staff will focus on strengthening the relationships among the public, industry, and government. The EUB Fort McMurray staff will provide local expertise, resources, and assistance.

With plans to be fully staffed in 2004, the Fort McMurray office will be responsible for application processing, operational surveillance, field surveillance, environmental monitoring, communications, and aboriginal relations in regard to oil sands mining.

1.7.5 Annual Joint Information Session

For the last three years, the EUB, Sustainable Resources Development, and Alberta Environment field staff from around the province have participated in workshops to foster an understanding of the roles and responsibilities of each group and to improve working relationships at the field level. These sessions have been well received and have clearly improved the understanding staff have of the other agencies. Another goal of the sessions is to increase staff knowledge and understanding of areas where roles overlap.

EUB Action

- The fourth annual joint information session is being planned for March 2004. This year staff from the Natural Resources Conservation Board will also be involved in the workshop.

2 Drilling and Servicing

2.1 Introduction

The EUB is responsible for regulating drilling and servicing operations to ensure public safety, conservation of resources, and protection of the environment. This responsibility is accomplished through existing regulations and requirements, which include conducting inspections, monitoring licensee and contractor performance, evaluating incidents, and applying fair and firm enforcement action in cases of noncompliance.

Drilling and servicing in Alberta over the last five years have been extremely active, with over 70 000 wells drilled. This has resulted in many challenges for both industry and EUB, namely, the drilling and servicing of wells safely, with minimal impact on the environment and public.

2.2 Well Control Occurrences

The well occurrence data collected by the EUB assist staff in monitoring industry performance and identify when changes to regulations, inspection procedures, or operating practices may be required.

Kicks,[5] blows,[6] blowouts,[7] and industry's response to these incidents continue to be the primary indicators of industry's drilling and servicing performance.

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[5] Kick—During drilling operations, any unexpected entry of water, gas, oil, or other formation fluid into a wellbore that is under control and can be circulated out.

[6] Blow—The unexpected release of wellbore fluids (gas, oil, water, mud) to the atmosphere. The flow can be controlled almost immediately by shutting the well in using wellhead valves or blowout prevention equipment or by directing the flow to the flare system until the well is killed.

[7] Blowout—The complete loss of control of the flow of fluids (gas, oil, water, mud) from a well. Control can only be regained by installing or replacing equipment to permit shut-in or killing the well or by drilling a relief well.

Industry's continued commitment to high training standards for rig personnel in well control and crew training has helped keep well control occurrences to a minimum. These will continue to be high-priority inspection areas for EUB staff.

2.2.1 Drilling—Blowouts/Blows/Kicks

During the drilling of 17 108 wells in 2003, one blowout and three blows were recorded (see Table 4). The blowout occurred during the first stage of drilling, when no surface pipe or blowout preventers were in place. This blowout resulted in a freshwater flow, while the three blows that occurred were sweet gas flows of short duration. None of the four incidents resulted in any significant impact on the public or the environment.

Table 4. Drilling and servicing well control occurrences, 2003

	Drilling	Servicing
Blowouts	1	4
Blows	3	7
Kicks	106	N/A

In 2003, there were 106 kicks recorded. This equates to a kick occurrence rate of approximately 6 kicks per 1000 wells drilled. This rate has remained relatively constant for the last five years and is a significant improvement from the years prior to 1998, when the average was 23 kicks per 1000 wells drilled.

2.2.2 Servicing—Blowouts/Blows

In well servicing operations, a total of four blowouts and seven blows occurred in 2003 (see Table 4). Three of the blowouts and the seven blows were sweet gas releases, while the remaining blowout resulted in a small release of sour gas to atmosphere. All of the blowouts were of short duration and were successfully brought under control with minimal environmental impact.

EUB Action

- The EUB has improved its process for analyzing the causes and effects of all blows and blowouts. This process assists staff to identify when changes to equipment, procedures, or regulations are required, which should reduce occurrences in the future. The EUB will continue to refine this process in 2004.

2.3 Drilling—Activity Level, Inventory, and Inspections

2003 was a record year for wells drilled in Alberta. A total of 17 108 wells were drilled.[8] This compares to the 13 193 wells drilled in 2002 (see Table 5) and represents a 29.7 per cent increase compared to 2002.

The number of new wells drilled brings the total number of nonabandoned wells in Alberta to 180 382.

[8] For the purpose of this report, drilling activity includes spuds (new well starts) and re-entries into existing wells; it does not include completions of wells spudded in previous years.

Table 5. EUB drilling inspection results and activity

	1999/00	2000/01	2001/02	2002	2003
Wells drilled	11 548	14 621	14 307	13 193	17 108
Drilling rigs inspected	631	648	499	433	400
% inspected	5.5	4.4	3.5	3.3	2.3
% satisfactory	87.1	87.7	89.7	89.6	88.5
% unsatisfactory (minor, major, and serious)	12.9	12.3	10.3	10.4	11.5

2.3.1 Inspections

The EUB prioritizes all drilling rig inspections based on the weighting of three key criteria: *operator* (licensee/contractor) performance, site *sensitivity*, and *inherent* risk (OSI; see Section 1.3). EUB field staff apply consistent enforcement action for noncompliance to increase industry awareness and accountability.

During 2003, EUB field staff conducted 400 inspections on drilling operations, resulting in 354 satisfactory inspections (88.5 per cent) and 46 unsatisfactory inspections (11.5 per cent). All unsatisfactory items were brought into compliance. This compares to the previous year's results, when 10.4 per cent of inspections were recorded as unsatisfactory (see Table 5).

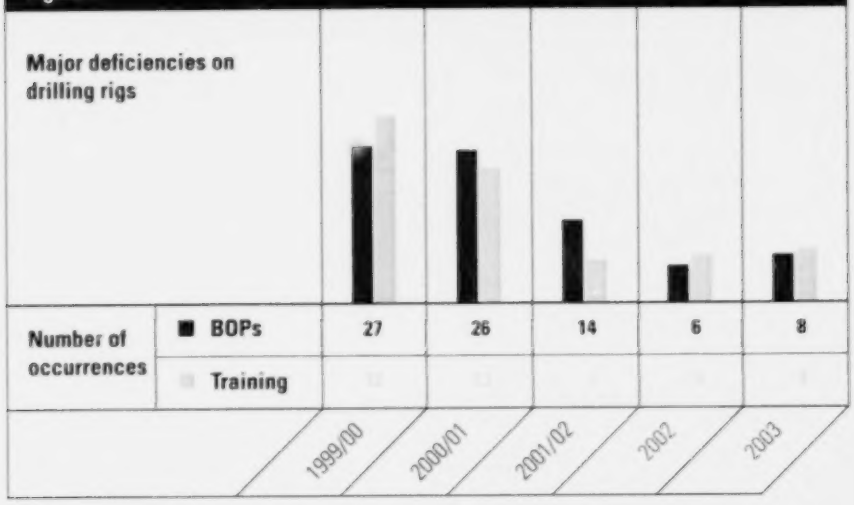
The EUB inspects all critical sour wells at least once during or immediately prior to drilling into the critical zone. In 2003, the EUB conducted 46 critical sour well drilling inspections. All inspections were satisfactory, with no minor, major, or serious deficiencies recorded.

2.3.2 Minor, Major, and Serious Unsatisfactory Items

Of the 46 unsatisfactory inspections recorded in 2003, there were 30 minor unsatisfactory inspections, 14 major unsatisfactory inspections, and 2 serious unsatisfactory inspections. The 16 major/serious unsatisfactory inspections resulted in 19 major/serious unsatisfactory items being recorded (see Section 1.3 for definitions of satisfactory inspection and minor, major, and serious unsatisfactory inspections). Operational failures of the BOP/accumulator systems resulted in 8 of the major unsatisfactory items, while deficiencies in crew training accounted for 9 major unsatisfactory items (see Figure 6). The two serious unsatisfactory inspections recorded in 2003 were the result of emergency response plan (ERP) deficiencies. This compares to 2002, when 6 major deficiencies of the BOP/accumulator system and 8 major deficiencies in crew training were noted. There were no serious deficiencies recorded in 2002.

Drilling operations were suspended at 11 rigs with major and serious unsatisfactory items until the deficiencies were corrected. The total time the 11 rigs were shut down was about 117 hours. This compares to 2002, when 14 rig shutdowns totalled 21 hours.

Figure 6



EUB Action

- The EUB will continue to adjust its drilling inspection levels as necessary to ensure that industry compliance is maintained.

2.4 Servicing—Activity Level and Inspections

2003 was a busy year for well servicing activity in Alberta. This was due in part to the record number of wells drilled during the year.

2.4.1 Inspections

In 2003, EUB field staff conducted 223 inspections on well servicing operations, resulting in 202 satisfactory inspections (90.5 per cent) and 21 unsatisfactory inspections (9.5 per cent). All unsatisfactory items were brought into compliance. This compares to 2002, when 6.3 per cent of inspections were recorded as unsatisfactory (see Table 6).

Table 6. EUB servicing inspection results

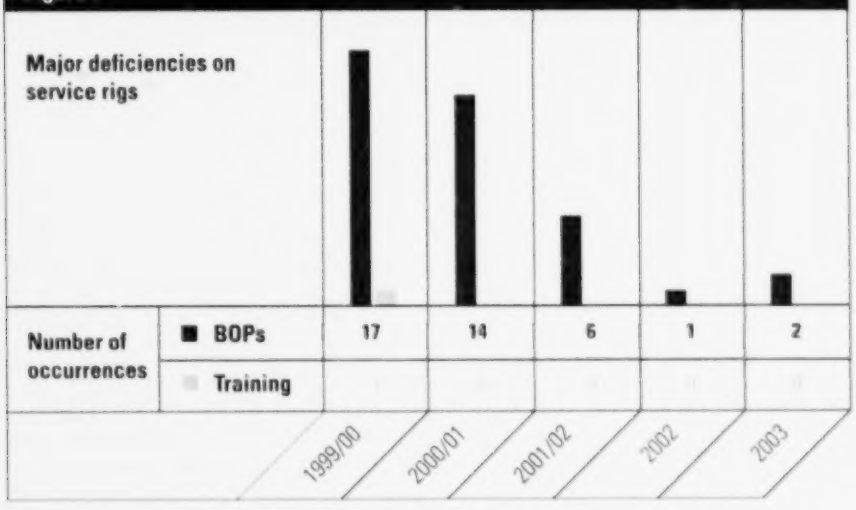
	1999/00	2000/01	2001/02	2002	2003
Service rigs inspected	350	348	262	238	223
% satisfactory	89.7	87.1	90.5	93.7	90.5
% unsatisfactory (minor, major, and serious)	10.3	12.9	9.5	6.3	9.5

2.4.2 Minor, Major, and Serious Unsatisfactory Items

Of the 21 unsatisfactory inspections noted in 2003, there were 19 minor unsatisfactory inspections and 2 major unsatisfactory inspections. This compares to 2002, when 14 minor unsatisfactory inspections and 1 major unsatisfactory inspection were recorded. There were no serious unsatisfactory inspections in 2002 or 2003.

Operational failure of the BOP/accumulator systems accounted for both major deficiencies noted in 2003 (see Figure 7). This compares to 2002, when 1 operational failure of the BOP/accumulator system was recorded.

Figure 7



Servicing operations were suspended at the 2 rigs with major unsatisfactory items until the deficiencies were corrected. The total time the 2 rigs were shut down was about 12 hours. This compares to 2002, when 1 rig shutdown totalled 1.5 hours.

EUB Action

- The EUB will continue to adjust its servicing inspection levels as necessary to ensure that industry compliance is maintained.

2.5 Public Complaints—Drilling and Servicing

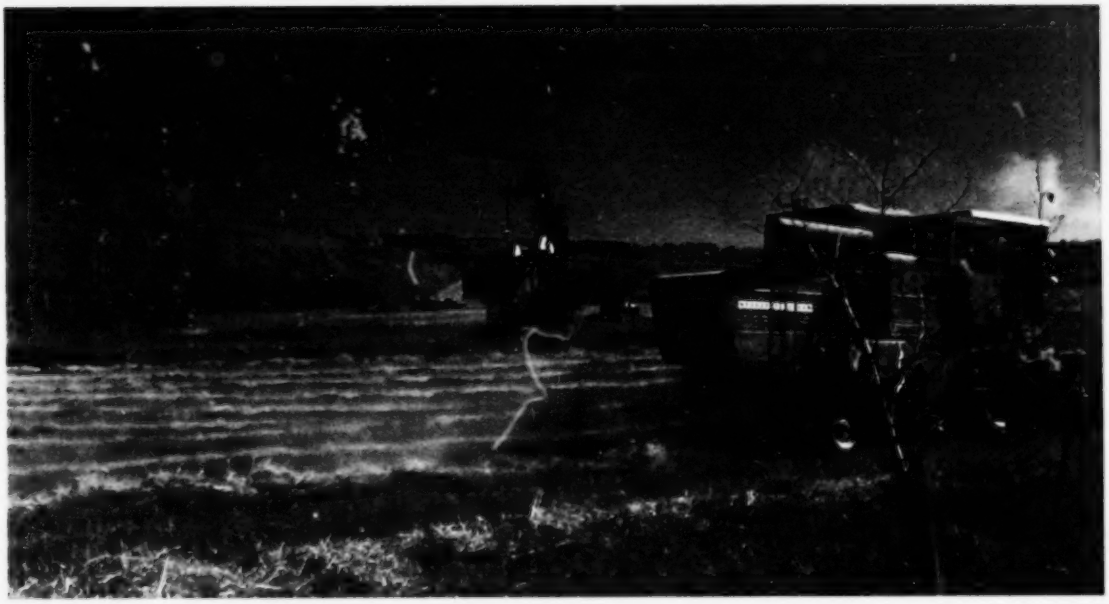
During 2003, EUB field staff investigated 48 public complaints related to the drilling and servicing of wells. The cause of the complaints varied and included such issues as noise, odours, and dust created by drilling and service rig traffic. This compares to 2002, when 57 public complaints were received for similar issues.

Public complaints remain an EUB priority. The EUB immediately investigates all public complaints related to the drilling and servicing of wells in Alberta and ensures that appropriate action is taken.

2.6 Inspection Manual Reviews—Drilling and Servicing

The EUB is currently updating both *Guide 36: Drilling Rig Inspection Manual* and *Guide 37: Service Rig Inspection Manual*.

The revised *Guide 36* will be released in the fall of 2004. It is anticipated that the draft version of *Guide 37* will be available for stakeholder review in 2005.



3 Oil Production

3.1 Introduction

EUB staff inspect oil production facilities to ensure compliance with requirements. Inspections focus on identifying potential hazards that may affect the public or the environment.

EUB staff spent a significant amount of time conducting licensee awareness sessions to increase industry's understanding of EUB requirements and the consequences for noncompliance. These awareness sessions were conducted on a individual and group licensee basis, which included the review of EUB *Guide 64: Facilities Inspection Manual*, *Guide 60: Upstream Petroleum Industry Flaring Guide*, *IL 99-4: EUB Enforcement Process*, and procedures regarding maintenance and the transferring of fluid at sour facilities.

3.2 Inventory, Activity Level, and Inspections

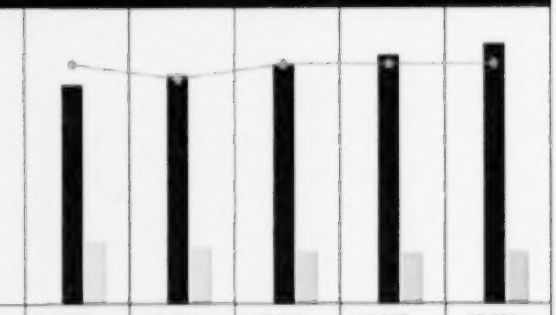
The current inventory of conventional oil and crude bitumen batteries/satellites has increased from previous years. As of the end of 2003 it was

- sweet multiwell batteries 1583
- sour multiwell batteries 694
- sweet single-well batteries 9082
- sour single-well batteries 1266
- sweet satellites 3162
- sour satellites 1494

Figure 8 shows the inventory of oil batteries and associated satellites, the number of battery/satellite inspections, and the percentage found to be satisfactory since 1999/2000 (see Section 1.3 for definitions of satisfactory inspection and minor, major, and serious unsatisfactory inspections). The battery and satellite inspections conducted in 2003 had a 64.0 per cent satisfactory inspection rate, consistent with the previous year's satisfactory inspection rate. Of the 36.0 per cent unsatisfactory inspections, 33.8 per cent were minor unsatisfactory inspections.

Figure 8

Oil production—inventory, facility inspections, and percentage satisfactory



	1999/00	2000/01	2001/02	2002	2003
Inventory	14 634	15 261	15 911	16 527	17 281
Battery/satellite inspections					
Percentage satisfactory	63.9	60.2	64.0	64.0	64.0

Using the OSI[9] priority inspection process, EUB staff conducted 3483 battery and satellite inspections in 2003. This compares to the previous year, when 3443 inspections were conducted.

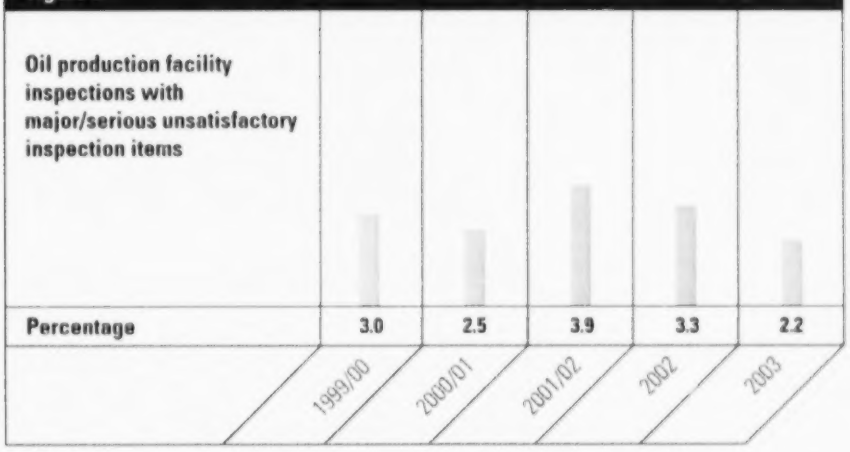
There were 77 major unsatisfactory inspections and 1 serious unsatisfactory inspection in 2003. As a result, 16 oil production facilities were suspended (see Table 2, on page 6). Appropriate enforcement action was taken on the remaining facilities to bring them into compliance. This compares with 113 major/serious unsatisfactory inspections identified in 2002.

Figure 9 shows the percentage of battery/satellite inspections with major/serious unsatisfactory inspections since 1999/2000.

[9] As stated in Section 1.3, the EUB conducts inspections based on priority selection criteria that include *operator* (licensee/contractor) performance history, site *sensitivity*, and *inherent* risk of the operation (OSI).

Figure 9

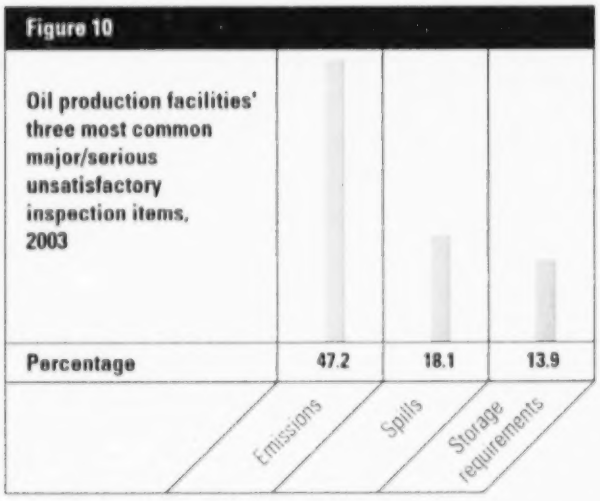
Oil production facility inspections with major/serious unsatisfactory inspection items



The three most common major/serious unsatisfactory inspection items found in 2003 are shown in Figure 10.

Figure 10

Oil production facilities' three most common major/serious unsatisfactory inspection items, 2003



The most common major/serious unsatisfactory inspection items were

- equipment failure resulting in H_2S emissions off lease,
- licensee not appropriately cleaning up spills, and
- no dike installed around the production tanks, resulting in inadequate secondary containment.

All noncompliant inspections were dealt with in accordance with *IL 99-4*. The EUB will continue to meet with licensees to discuss inspection results, focusing on identifying the most common unsatisfactory items and finding solutions to improve licensee compliance.

EUB Action

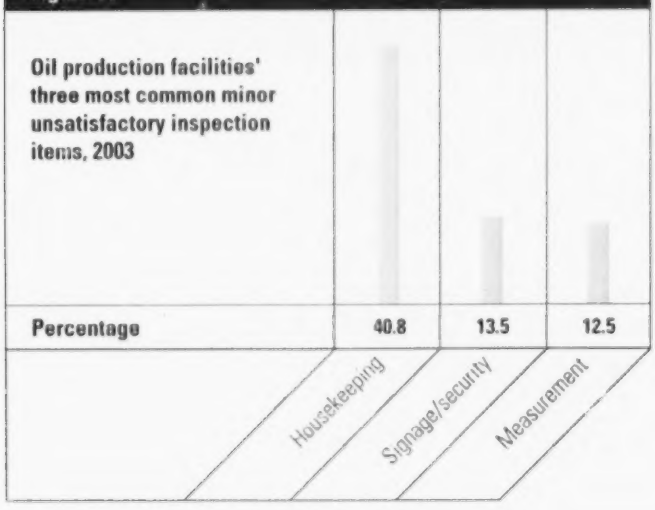
- Sour facilities with site-specific emergency response plans are a priority inspection for the EUB. Residents are contacted to ensure that they are aware of the requirements of the emergency plan. These residents are also provided with copies of the EUB facility inspection results. This process will continue in 2004.

Minor unsatisfactory conditions were found in 1177 of the 3483 inspections (33.8 per cent) in 2003. All unsatisfactory inspection items were brought into compliance. This compares with 1126 minor unsatisfactory conditions in 3443 inspections (32.7 per cent) for the previous year. The most common minor unsatisfactory items found in 2003, shown in Figure 11, were

- housekeeping
  - garbage and debris not stored properly
  - oil-stained areas on lease not cleaned up
- signage/security
  - no identification or warning signs posted
  - fencing not adequate
- measurement
  - gas meter calibration expired
  - oil meter calibration expired

Figure 11

Oil production facilities' three most common minor unsatisfactory inspection items, 2003

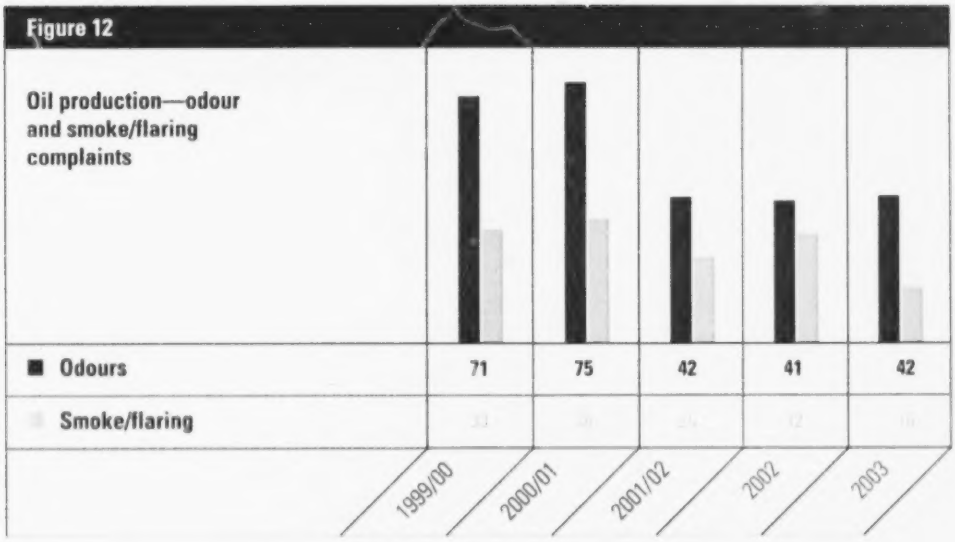


3.3 Public Complaints

During 2003, there were 97 public complaints related to oil production facilities. This compares to 108 public complaints related to oil production facilities last year. Every complaint was investigated and appropriate enforcement was applied where there was noncompliance. There were 58 public complaints related to odours, flaring, and smoke, compared to 73 similar complaints in 2002 (see Figure 12).

Figure 12

Oil production—odour and smoke/flaring complaints



Investigation of these complaints identified the most common causes of odours to be

- vapour recovery units inadequate to handle stock tank vapours,
- thief hatches not sealing properly, and
- improper trucking practice when hauling sour fluids.

The most common causes of flaring and smoke were

- incomplete combustion of solution gas, and
- solution gas flaring associated with planned/emergency shutdowns.

The EUB requires licensees to investigate all sources of emissions and install equipment or use other technology to reduce emissions. In addition, licensees are required to closely monitor operations and improve communications with area residents.

The EUB reviews the public complaint history of each oil production facility to determine if there have been repeat complaints. If there have been, EUB field staff take additional action as necessary to achieve lasting improvement.

During 2003, field staff identified 8 oil facilities as having repeat complaints. These were related to odours, flaring, smoke, noise, spills, and lease management. Repairs and facility upgrades were made by the licensees to remedy the problems. This compares to 15 oil facilities having repeat complaints in 2002.

Field Surveillance held a number of awareness sessions throughout the province for licensees in sour areas. The objective was for industry to work cooperatively to minimize off-lease odours from their facilities, thus reducing the impact on the public. The expectation is that industry will investigate and develop best operating practices to minimize off-lease emissions.

EUB Action

- To reduce the potential for public complaints, the EUB has increased the inspection frequency at sour facilities that have had major or serious unsatisfactory inspections.

The increased inspections will continue, and the results will be reported as part of our overall facility inspection statistics.

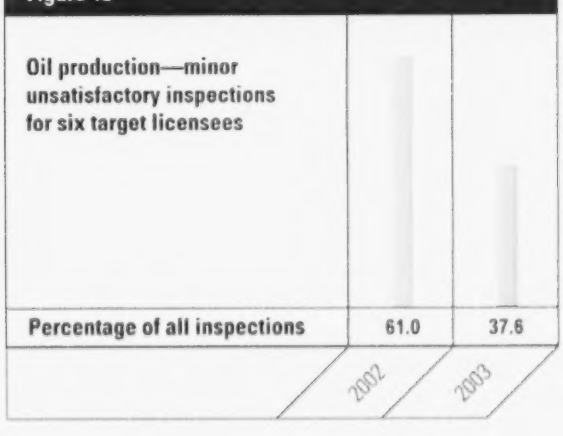
- The EUB will continue to conduct sour group licensee awareness sessions in an effort to reduce public and environmental impacts.

3.4 Licensees with High Minor Unsatisfactory Inspection Rates

The process to identify licensees with a minor unsatisfactory inspection rate significantly above the industry average is described in *IL 99-4*. The EUB identified 6 licensees that had a minor unsatisfactory inspection rate greater than 50 per cent between January 1 and December 31, 2002. EUB staff met with each licensee to review its inspection record, developed an action plan to address the high minor unsatisfactory rate, and outlined the escalating enforcement consequences that would occur if the inspection record did not show improvement.

The 6 licensees had a combined total of 141 initial inspections in 2002. Minor unsatisfactory conditions were found at 86 oil production facilities, resulting in a 61.0 per cent unsatisfactory rate. After reviewing the individual inspection records with each of the 6 licensees, 109 follow-up inspections were conducted on the facilities between June 30 and December 31, 2003. Minor unsatisfactory conditions were identified at 41 facilities, resulting in a 37.6 per cent unsatisfactory rate (see Figure 13). Further improvements are expected as these licensees implement additional measures to ensure compliance.

Figure 13

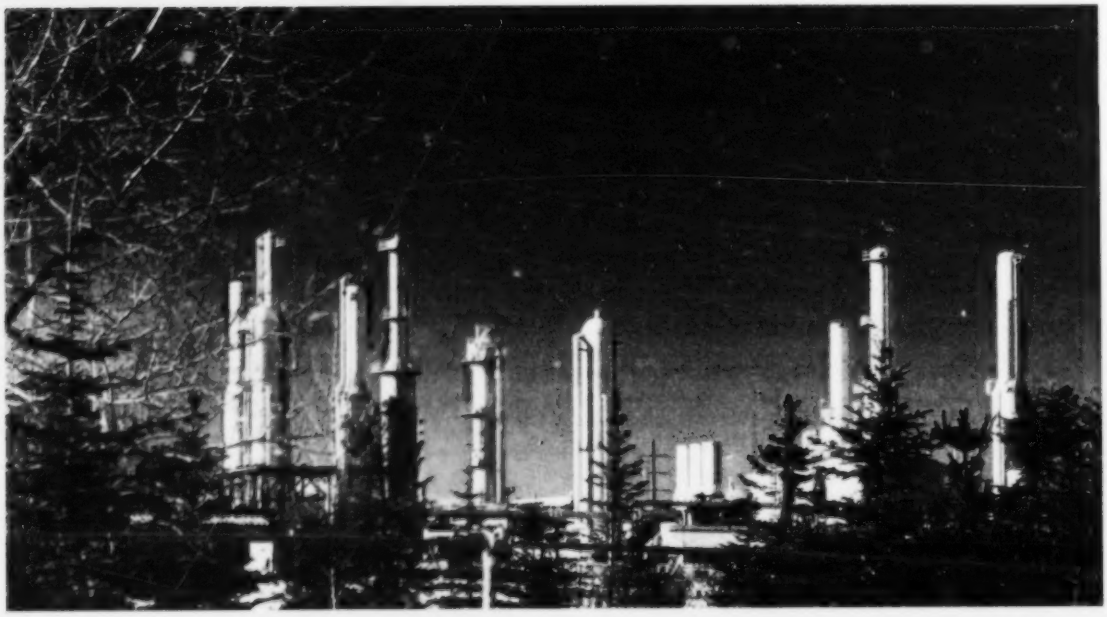


Measures taken by these licensees to improve their compliance rate included

- conducting independent third-party inspections and self-audits at their facilities and notifying the EUB of any noncompliance items,
- conducting meetings with trucking firms to inform them of the necessity of maintaining a clean operation, and
- conducting meetings with licensee personnel and contract operators to ensure that they are aware of EUB requirements.

EUB Action

- The EUB monitors the inspection record of licensees and will continue to meet with them when significantly high minor unsatisfactory rates are identified to ensure that procedures are implemented to improve their compliance record.



4 Gas Production

4.1 Introduction

Gas inspection results and industry activity levels are analyzed to determine emerging issues, with emphasis placed on the highest risk areas to ensure that impacts on the environment and the public are kept to a minimum. These areas include

- flare reduction review,
- licensees with high minor unsatisfactory inspection rates, and
- sour area operator meetings.

The EUB's responsibility to ensure consistent application of enforcement policies, processes, and regulatory requirements is an ongoing priority. EUB Field Surveillance staff will continue to target gas plants, gas batteries, gas gathering systems, and gas well tests to ensure industry compliance.

4.2 Inventory, Activity Level, and Inspections

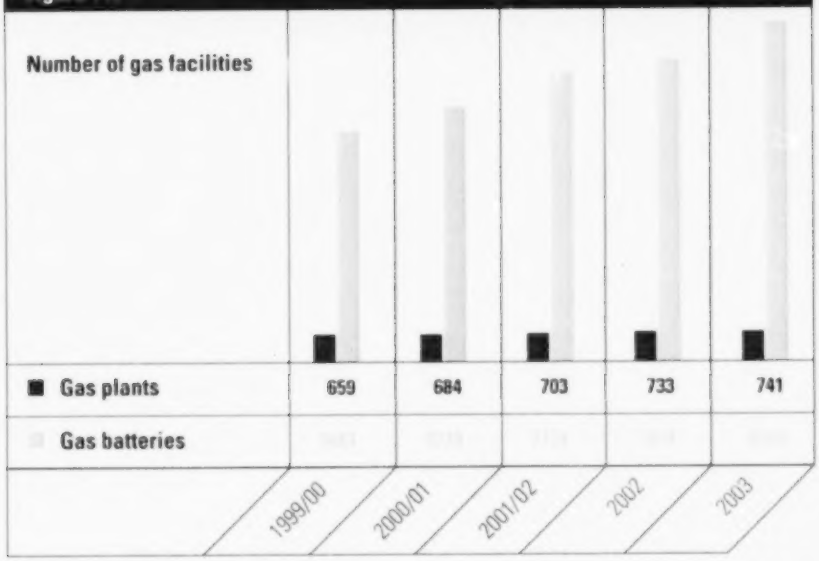
The current inventory of gas production facilities has increased from previous years. As of the end of 2003 it was

- gas wells (producing) 77 544
- sweet single batteries 3 215
- sweet multibatteries 3 372
- sweet plants 483
- sour single batteries 1 159
- sour multibatteries 619
- sour plants 258

The number of producing gas wells in Alberta increased by 7849 in 2003 from the previous year. This has resulted in an increase in gas batteries, which totalled 8365 (see Figure 14).

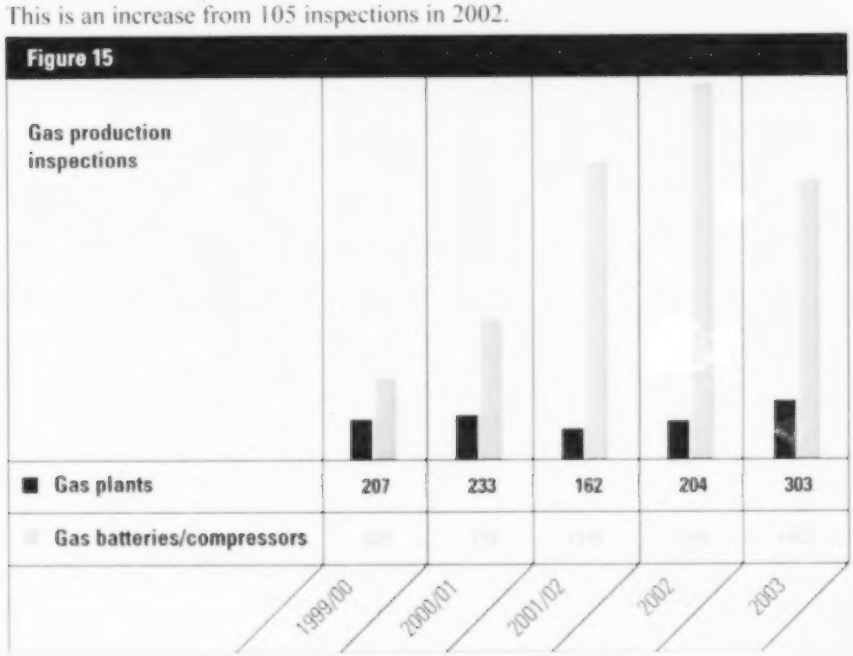
The number of gas plants increased slightly, as shown in Figure 14. In 2003, there were 741 gas plants operating in the province.

Figure 14



There were 1766 inspections completed on gas processing facilities in 2003, including 15 operational audits. This was a decrease compared to 2002, when 2170 inspections were conducted (see Figure 15). In 2003, EUB field staff conducted 124 inspections of well tests to ensure compliance with *Guide 60: Upstream Petroleum Industry Flaring Guide*. This is an increase from 105 inspections in 2002.

Figure 15

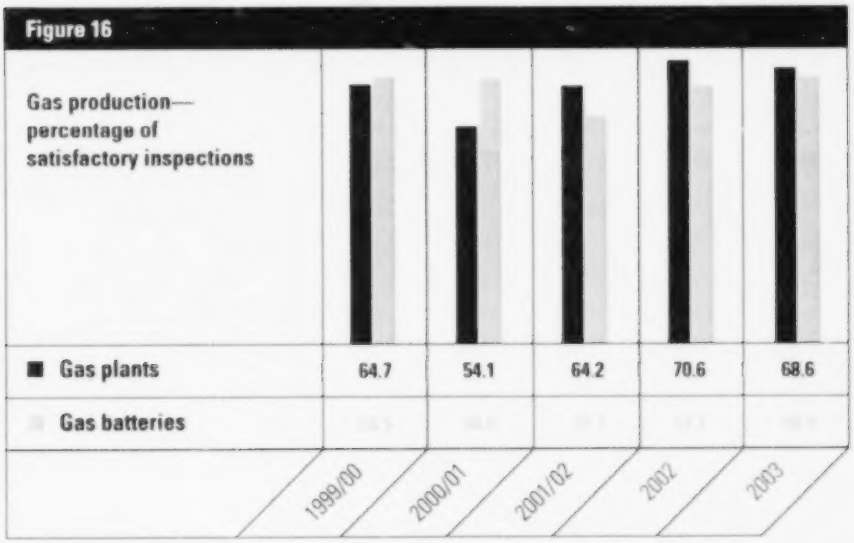


EUB Action

- The EUB will continue to adjust its gas processing facility and gas well test inspection levels as necessary to ensure continued improvement in the level of compliance. In addition, EUB staff will continue to focus inspections on gas gathering systems and compressor stations in 2004.

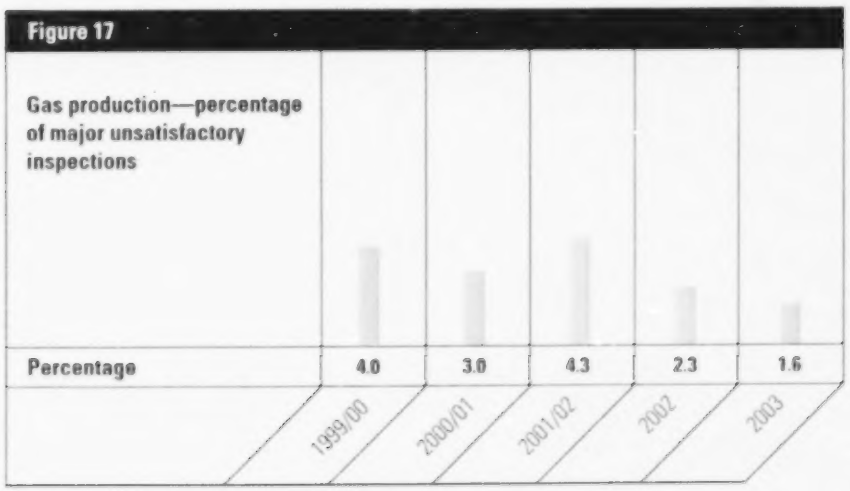
As shown in Figure 16, the satisfactory inspection percentage decreased in 2003 for gas plants and increased for gas batteries. (See Section 1.3 for definitions of satisfactory inspections and minor, major, and serious inspections.) Follow-up inspections were conducted on all gas production facilities, and all facilities were brought into compliance.

Figure 16



The major unsatisfactory inspection percentage decreased from 2.3 per cent in 2002 to 1.6 per cent in 2003 (see Figure 17). Minor unsatisfactory inspections decreased from 33 per cent in 2002 to 31.5 per cent in 2003. These decreases can be attributed to industry's increased understanding of EUB requirements. No serious unsatisfactory inspections were conducted in 2003, and all facilities were brought into compliance.

Figure 17



The most common major unsatisfactory inspection items in 2003 were

- off-lease sour gas emissions,
- unaddressed hydrocarbon spills, and
- storage.

The most common minor unsatisfactory inspection items in 2003 were

- gas measurement problems,
- poor housekeeping practices, and
- signage.

Figure 18 shows the most common major and minor unsatisfactory inspections items in 2003.

Figure 18

Gas production—most common major and minor unsatisfactory inspection items, 2003

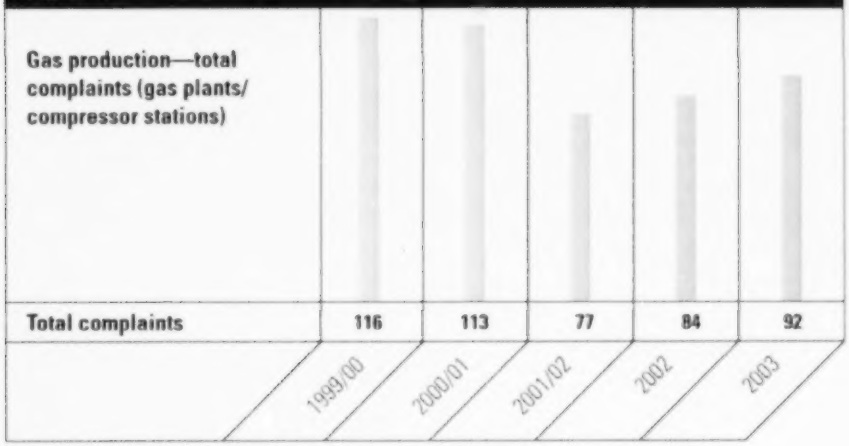
4.3 Public Complaints

The number of public complaints from gas processing facilities (gas plants and compressor stations) increased from 84 in 2002 to 92 in 2003 (see Figure 19). In addition, 118 complaints were directed at gas well installations. This compares to 152 in 2002.

The impact gas processing facilities have on the public continues to be of concern to the EUB. Fugitive emissions, noise from compressors, flaring, and black smoke are the primary potential impacts.

The EUB is currently revising *Guide 60*, which addresses a broad range of flaring and venting issues in Alberta. Inspections and audits of well test flaring operations will continue to be a priority. EUB field staff will focus on flaring operations in populated areas and those wells flaring more than 5 per cent H_2S.

Figure 19



EUB Action

- 15 gas plant operational audits were conducted in 2003, the same number conducted in 2002. The EUB will continue to emphasize gas plant operational audits in 2004.

4.4 Licensees with High Minor Unsatisfactory Inspection Rates

The process to identify licensees with a minor unsatisfactory inspection rate significantly above the industry average is described in *IL 99-4: EUB Enforcement Process*. The EUB identified two licensees that had a minor unsatisfactory inspection rate greater than 50 per cent in 2002. EUB staff met with each licensee to review its inspection record, developed an action plan to address the high minor unsatisfactory rate, and outlined the escalating enforcement consequences that would occur if its inspection record did not show improvement.

In 2002, two licensees had a combined total of 55 inspections. Minor unsatisfactory conditions were found at 31 gas production facilities, resulting in a 56.4 per cent unsatisfactory rate. A follow-up review of the licensees was conducted over a three-month period from July to September 2003, and the minor unsatisfactory rate was 28.6 per cent. Further improvements are expected as these licensees continue to implement additional measures to ensure compliance.

EUB Action

- The EUB will continue to meet with licensees that have significantly high minor unsatisfactory rates to ensure that the procedures are implemented to improve their compliance record.

4.5 Gas Plant Flare Surveillance Program

Gas plants operating in Alberta are allowed to flare 1.0 per cent of the plant inlet volume in the first year of operation and 0.5 per cent of inlet volume in subsequent years. In 2003, the EUB reviewed 74 licensees that had been identified as having excessive gas plant flaring. In all cases, remedial action was taken to ensure compliance.

EUB Action

- Monitoring the flaring from all gas plants has proven to be effective, and the EUB will continue with this program in 2004.

4.6 Sulphur Recovery

Sulphur recovery efficiencies at gas plants recovering salable sulphur is at 98.9 per cent. Overall, sulphur emissions have decreased by 21 per cent since 2000 (from 77 000 to 61 000 tonnes of sulphur emissions). This decrease is due to the declining sulphur inlets at these plants and the EUB/Alberta Environment *Interim Directive (ID) 2001-3: Sulphur Recovery Guidelines for the Province of Alberta*, which has resulted in improved performance (see Figure 20).

The sulphur recovery ID details the requirements when a plant has to be relicensed to meet the new sulphur recovery standards. In the last four years, 11 sour gas plants have been relicensed to meet the new standards. For 8 of these plants, it has meant the addition of significant new equipment. Details of these changes are in a new annual EUB publication (first published in November 2003) entitled *Statistical Series (ST) 101: Sulphur Recovery and Sulphur Emissions at Alberta Sour Gas Plants. ST 101* allows licensees of plants with sulphur recovery to take immediate advantage of performance improvements to delay the full relicensing requirements.

4.7 Sour Area Operator Meetings

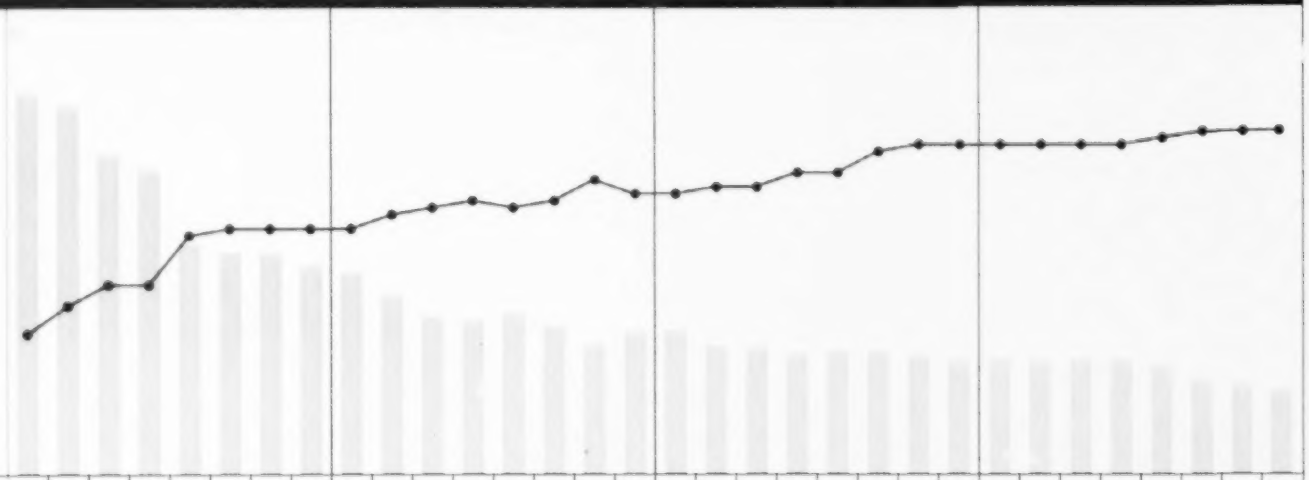
Field Surveillance held a number of awareness sessions throughout the province for licensees in sour areas. The objective was for industry to work cooperatively to minimize off-lease odours from their facilities, thus reducing the impact on the public. The expectation is that industry will investigate and develop best operating practices to minimize off-lease emissions.

EUB Action

- The EUB will continue to conduct sour group licensee awareness sessions in an effort to reduce public and environmental impacts.

Figure 20

Efficiency versus emissions of sulphur recovery plants



	Sulphur emissions (thousand tonnes)																														
●	**Recovery efficiency** (percentage)	95.0	96.4	96.7	96.7	97.4	97.5	97.5	97.5	97.5	97.7	97.8	97.9	97.8	97.9	98.2	98.0	98.0	98.1	98.1	98.3	98.3	98.6	98.7	98.7	98.7	98.7	98.7	98.7	98.8	98.9	98.9	98.9
	Year	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003

5 Pipeline

5.1 Introduction

Licensees operating pipelines in Alberta are responsible for complying with all applicable standards and EUB regulations. Inspection processes are in place to monitor compliance and apply enforcement measures for noncompliance. (See Section 1.3 for additional information on the EUB's inspection criteria and for definitions of satisfactory inspection and minor, major, and serious unsatisfactory inspections.) When major or serious unsatisfactory inspection items have been found, the pipeline was suspended until appropriate remedial action was taken (see Table 2, page 6).

Integrity management programs have proven to be successful in reducing pipeline failure occurrences. Field Surveillance will continue monitoring these programs to identify whether there is a need to implement similar programs with licensees that have high failure occurrence rates.

The EUB field staff focus their activities on four key inspection areas:

1) **Pipeline failures/hits**—The Alberta *Pipeline Act* requires all licensees of pipelines to report any pipeline failures/hits to the EUB regardless of the cause, magnitude, or consequence. EUB field staff review the cause of the failure/hit to ensure that mitigative measures are taken to prevent similar occurrences in the future.

2) **Construction and pressure testing**—EUB field staff conduct inspections on new pipeline installations to ensure compliance with the requirements.

3) **Operations inspections**—EUB field staff conduct inspections on existing pipeline systems to ensure that licensees conduct operational and maintenance activities in accordance with the requirements (maintenance of valves, cathodic protection

systems, corrosion monitoring and control systems, right-of-way and warning signs, emergency contact numbers, etc.).

4) **Contact damage**—EUB field staff inspect sites where pipeline contact damage has occurred. Awareness seminars are held for licensees and contractors to educate them on requirements that must be met prior to commencing ground disturbance activities to reduce incidents of pipeline hits, enhance public safety, and mitigate environmental impacts.

The length and type of permitted pipelines in Alberta under EUB jurisdiction for 1996-2003 are listed in Table 7.

Table 7. Length of permitted pipelines by type in Alberta under EUB jurisdiction, 1996-2003 (km)

Year	Crude oil	Natural gas	Sour gas	Water	Multiphase	Others	Total
Total prior to 1996	13 126	122 283	8 003	14 021	33 501	16 148	207 081
1996	393	7 082	870	631	1 864	948	11 787
1997	938	9 798	1 377	1 225	3 058	1 550	17 947
1998	663	10 111	1 920	1 062	2 363	2 811	18 929
1999	1 086	9 541	1 574	605	1 510	1 725	16 042
2000	204	11 364	1 206	490	1 609	1 181	16 055
2001	408	12 539	1 504	773	2 389	1 164	18 777
2002	300	8 064	540	380	962	553	10 799
2003	273	11 715	695	546	1 112	706	15 047
TOTAL	17 391	202 497	17 689	19 733	48 368	26 786	332 464

[1] Numbers were calculated by adding all statuses (operating, permitted, abandoned, discontinued, and suspended) for all types of pipelines as of December 31 of each year.

5.2 Pipeline Failures/Hits

A pipeline failure is defined as the failure of the pipeline to contain the substance being transported. For statistical purposes, pipeline hits are included in the pipeline failure numbers.

- A hit is defined as striking a buried pipeline during a ground disturbance activity resulting in the pipeline or pipeline coating being damaged. A release of product does not necessarily result.
- A leak is defined as an opening, crack, or hole in a pipeline causing some product to be released, but not immediately impairing the operation of the pipeline.
- A rupture is defined as the instantaneous tearing or fracturing of the pipeline material, immediately impairing the operation of the pipeline.

The EUB's release reporting and inspection priority system applies to all pipeline releases and is defined as follows:

- Priority 1 releases are those that pose the most serious environmental and public impact. EUB field staff make every attempt to immediately respond to the location; however, when that is not possible, all attempts are made to have another regulatory

agency respond for the initial assessment. In these cases, EUB staff will conduct an inspection as soon as possible.

- Priority 2 releases are those where a significant volume has been released or the impact on the environment is a concern. They may include low-volume releases if the licensee is new or has a poor inspection history. These sites are generally inspected within 7 working days.

- Priority 3 releases are low-volume but may include medium-volume releases if the licensee has a satisfactory inspection history. In these cases, EUB staff have a high degree of confidence that the release will be appropriately handled. Historically, about 25 per cent of priority 3 spills are inspected to ensure that they are satisfactorily addressed.

If a pipeline failure/hit occurs, the licensee or operating company is required to inform the local EUB Field Centre. EUB field staff record the information into a database, including date of occurrence, geographic location, pipeline specifications, operating conditions, environmental release information, cause, and priority rating of the release.

There were 28 ruptures in 2003, compared to 34 ruptures in 2002. Table 8 shows the various causes of failures and corresponding inspections during 2003.

Figure 21 shows the types of releases compared to previous years. Leak detection systems, training and awareness programs, automated shut-in equipment, and pipeline patrols are effective in minimizing the effects of releases.

In 2003, Field Surveillance implemented a new computer database that enhanced the criteria used to prioritize releases. As a result, more scrutiny is provided for all releases. The priority is calculated by incident attributes that include the following:

- on-lease or off-lease spill,
- area sensitivity,
- whether release is sweet or contains H_2S,
- type of area affected,
- environment affected,
- wildlife/livestock affected, and
- affected public.

The following is a summary of the pipeline releases/hits from January 1 to December 31, 2003:

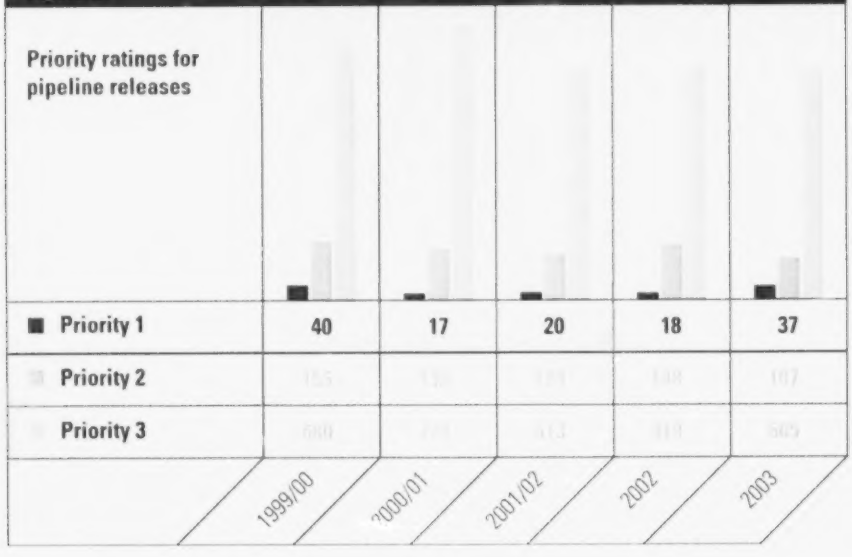
Ruptures	4%	Priority 1 releases	5%
Leaks	90%	Priority 2 releases	13%
Hits, no release	6%	Priority 3 releases	76%
	100%	No release	6%
			100%

Table 8. Failures/hits reported from January 1 to December 31, 2003[1]

Cause	Incidents #	Incidents %	Leaks #	Leaks Inspections	Ruptures #	Ruptures Inspections
Internal corrosion	350	44	350	203	0	0
External corrosion	86	11	84	66	2	2
Joint failure	13	1	13	1	0	0
Mechanical joint	28	3	28	5	0	0
Girth weld	8	1	7	4	1	0
Construction damage	50	6	48	38	2	1
Damage by others (hits with release)	21	3	9	9	12	12
Damage by others (hits, no release)	47	6	0	45	0	0
Earth movement	17	2	17	7	0	0
Mechanical damage	10	1	10	8	0	0
Fittings/valve failure	21	3	18	4	3	2
Installation failure	10	1	10	2	0	0
Weld failure	1	0	1	1	0	0
Seam failure	6	1	5	4	1	1
Pipe body failure	38	5	35	30	3	2
Overpressure	6	1	3	5	3	1
Licensee error	24	3	23	3	1	1
Miscellaneous	15	2	15	8	0	0
Unknown	45	6	45	3	0	0
TOTAL	796	100	721	446	28	22
% OF INCIDENTS		100	90		4.0	

[1] Statistics include 62 requalification test failures.

Figure 21



EUB staff review all failure incidents with the licensee and may require the licensee to perform a failure analysis when there has been no previous investigation of the cause of failure (corrosion mechanism is unknown). The licensee must also ensure the integrity of the pipeline and mitigate further occurrences.

EUB field staff conducted 468 inspections in 2003, focused primarily on corrosion-related failures, compared to 516 inspections the previous year. Staff investigate 100 per cent of corrosion failures. Not all corrosion failures are physically inspected; however, they are followed up through an investigation into the incident. In 2003, there were 451 satisfactory inspections, 4 minor unsatisfactory inspections, 12 major unsatisfactory inspections, and 1 serious unsatisfactory inspection. All unsatisfactory items were brought into compliance. In 2002 there were 46 major unsatisfactory inspections and no serious unsatisfactory inspections. The decrease in major unsatisfactory inspections can be attributed in part to the implementation of *Guide 66: Pipeline Inspection Manual*.

When a pipeline failure occurs, the licensee is required to do one or more of the following:

- undergo requalification pressure testing (of the 201 pipelines tested, 62 failed during the requalification pressure test)
- determine product flow velocities
- conduct analysis of product shipped and received (sampling)
- modify the existing system to enable corrosion rate monitoring
- install corrosion control devices
- conduct internal electromagnetic or ultrasonic inspections
- conduct cathodic protection surveys
- install pigging facilities
- conduct risk assessments

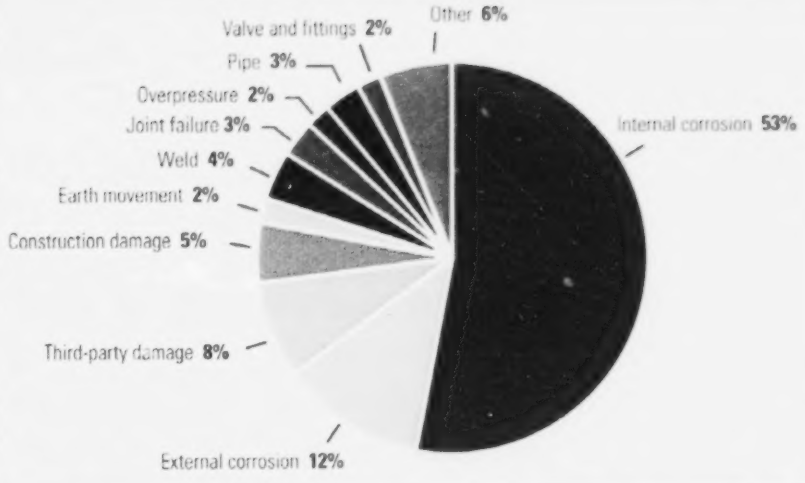
Figure 22 indicates that the distribution of all failure causes has remained relatively constant. Corrosion continues to be the main cause of pipeline failures. Internal corrosion has decreased from 447 failures in 2002 to 350 in 2003. In addition, external corrosion decreased from 116 failures in 2002 to 86 failures in 2003. This decrease can be attributed to a more rigorous investigation of the failure mechanism and mitigation action plans implemented by licensees.

Figures 22, 23, and 24 are overviews of historical data compared to the most recent year reported.

Figure 22

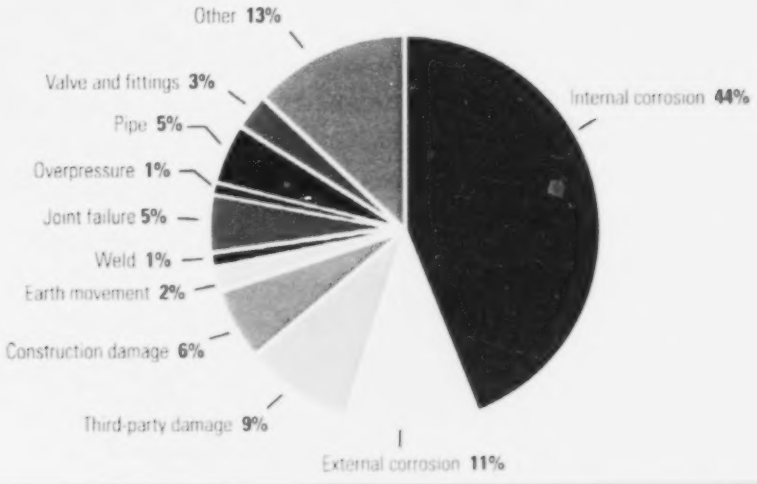
Historical pipeline failures by cause (%)

1980 - December 31, 2003



Pipeline failures by cause (%)

January 1 - December 31, 2003



EUB Action

- The EUB will continue to monitor the licensees' action plans for the severe external corrosion problem identified in the Swan Hills and Judy Creek fields in 2002. Results to date indicate a reduction in the number of external corrosion failures.

Part of the EUB's investigation of corrosion incidents requires failure analyses by the licensees to determine the causes. Licensees must implement recommendations from these analyses to mitigate future occurrences of pipeline corrosion. This has resulted in a decrease in corrosion-related failures in 2003.

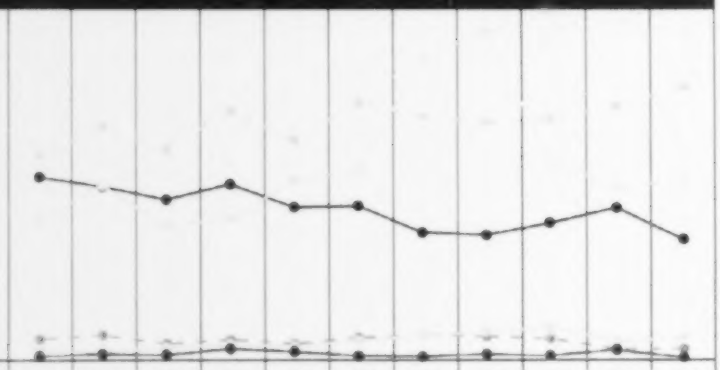
When compared to previous years, the number of failure incidents compared to total pipeline length in Alberta was reduced (Figure 25). The implementation of *Guide 66* clarified EUB expectations for identifying and addressing corrosion problems. In

addition, *Guide 66* outlines the EUB's enforcement policy related to pipeline corrosion deficiencies.

Figure 23 shows that the top three product lines that are failing are multiphase, natural gas, and water.

Figure 23

Historical pipeline incidents by product being transported



	1993	1994	1995	1996	1997	1998	1999	2000/01	2001/02	2002	2003
Water	233	221	204	224	194	196	162	159	174	193	157
Multiphase											
Crude	26	31	20	25	20	28	31	29	26	14	17
Sour gas											
Natural gas											
All other	4	6	5	13	9	4	3	6	4	10	9

Figure 24 shows that the majority of failures are occurring in smaller-diameter gathering lines, primarily the 60.3 mm (2 inch), 88.9 mm (3 inch), and 114.3 mm (4 inch) systems.

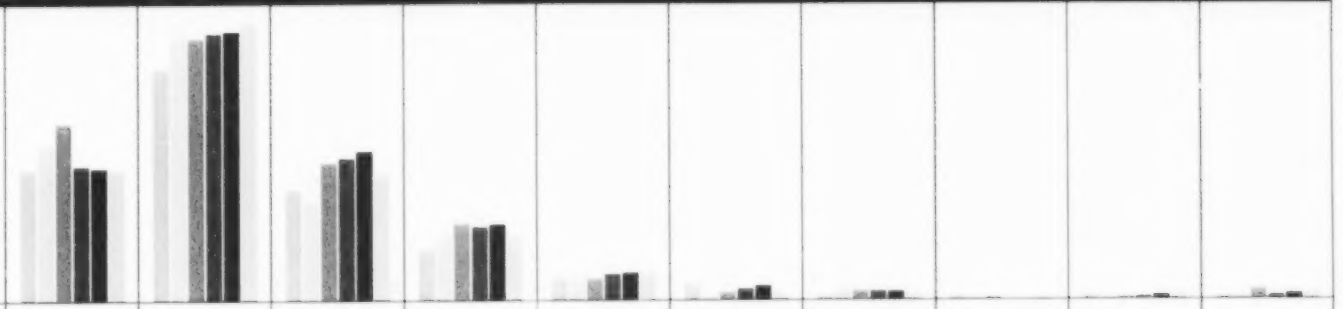
A number of organizations contribute considerable resources towards pipeline integrity, maintenance, operations, and safety. These include

- Alberta One-Call
- Canadian Association of Petroleum Producers (CAPP)
- Canadian Centre for Materials and Energy Technology (CANMET)
- Canadian Energy Pipeline Association (CEPA)
- Canadian Standards Association (CSA)
- Edmonton Area Pipeline and Utilities Operators' Committee (EAPUOC)
- National Association of Corrosion Engineers (NACE)

Regional, national, and international pipeline conferences and workshops are held to share technology and information, which is contributing to a reduction in the pipeline failure frequency rate.

Figure 24

Number of failures by pipeline size

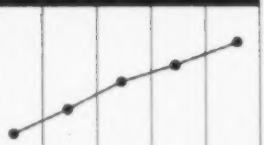


	60.3 mm (2")	88.9 mm (3")	114.3 mm (4")	168.3 mm (6")	219.1 mm (8")	273.1 mm (10")	323.9 mm (12")	355.6 mm (14")	406.4 mm (16")	>406.4 mm (>16")
1998	198	282	134	61	26	8	5	1	5	10
1999	208	301	144	70	28	8	5	1	5	10
2000/2001	215	318	167	93	25	9	11	2	2	12
2001/2002	163	324	172	89	31	13	10	0	2	4
2002	160	326	180	91	32	16	9	0	4	6
2003	0	0	0	0	0	0	0	0	0	0

Figure 25 shows that in 2003 the frequency of failure was about 2.4/1000 km, a substantial improvement over the 1998 benchmark of 5 failures/1000 km.

Figure 25

Failure incidents compared to total pipeline length



	1999	2000	2001	2002	2003
Length of pipeline (1000s of km)	272	288	306	317	332
Ratio (failures/1000 km)					

5.3 Construction and Testing Inspections

EUB field staff conducted 439 pipeline construction/test inspections in 2003, of which 405 were satisfactory, 25 were minor unsatisfactory, and 8 were major unsatisfactory inspections. There was 1 serious unsatisfactory inspection. All unsatisfactory inspection items were brought into compliance. This compares to 330 pipeline construction/test inspections conducted last year, when there were 283 satisfactory inspections, 40 minor unsatisfactory inspections, 7 major unsatisfactory inspections, and no serious unsatisfactory inspections. Examples of unsatisfactory items found include the following:

- Minor unsatisfactory inspection items
  - pipeline applications did not reflect proper information (pipe size, wall thickness, grade of pipe, and correct routing to and from locations). Note that in all cases the materials actually used exceeded requirements. Amendments were required to correct the pipeline applications.

- Major unsatisfactory inspection items
  - wall thickness of pipeline at road crossing improper
  - pipeline girth welds not 100 per cent radiographed for sour service
  - existing pipeline hit during construction
  - pipeline marked in the wrong location; hand excavation should have been done to verify the correct location
  - foreign pipelines not marked and work progressed in a controlled area
  - machinery working within 60 cm of pipeline without supervision

5.4 Operations Inspections

Operations inspections involve a field inspection of the pipeline system and a records review of maintenance documentation. In 2003, EUB field staff conducted operation inspections on 421 pipeline licences. The results were 256 satisfactory inspections, 148 minor unsatisfactory inspections, and 17 major unsatisfactory inspections. There were no serious unsatisfactory inspections during 2003. All unsatisfactory inspection items were brought into compliance. This compares to 186 inspections conducted last year, of which there were 65 satisfactory inspections, 85 minor unsatisfactory inspections, 36 major unsatisfactory inspections, and no serious unsatisfactory inspections. Examples of unsatisfactory items found include the following:

- Minor unsatisfactory inspection items
  - signage missing, defaced, or had incorrect licensee contact phone numbers
  - record updates to indicate proper operating status of pipeline incomplete
  - documentation of right-of-way patrols not complete

- Major unsatisfactory inspection items
  - emergency procedures manual information incorrect
  - valves/fittings or flanges not properly rated for pressure of system
  - cathodic protection surveys not performed
  - no cathodic protection

EUB Action

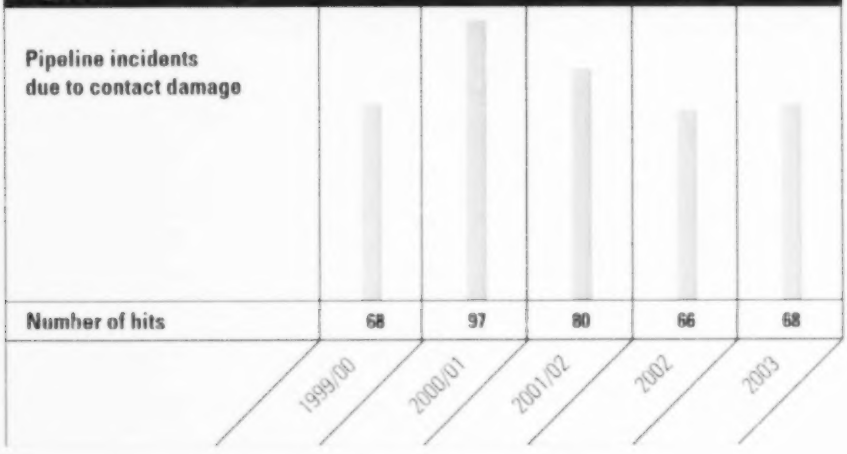
- The EUB will continue conducting detailed operations inspections that check a variety of items. Through these inspections, licensees that have failed to submit licence transfers and amendments will be identified and brought into compliance.

5.5 Contact Damage

The goal of this inspection area is prevention of pipeline damage (hits). When a licensee does not follow proper ground disturbance regulations, the EUB will apply enforcement, as detailed in *IL 99-4: EUB Enforcement Process*. There were 68 contact damage incidents recorded in 2003 (see Figure 26). Of these, there were 1 minor unsatisfactory item, 36 major unsatisfactory items, and 1 serious unsatisfactory item. All noncompliance issues were addressed. The remaining 30 incidents did not warrant enforcement action following an EUB review. This compares to 66 incidents the previous year, of which 17 incidents had major noncompliance items and none had serious noncompliance items.

Figure 26

Pipeline incidents due to contact damage



EUB field staff conducted 18 ground disturbance seminars for licensees that were found in noncompliance. A further 13 seminars were held for educational purposes, with about 700 people from industry and the public attending.

The EUB is proposing revisions to the *Pipeline Regulation* to reduce pipeline contact damage. Stakeholder review occurred in 2003. Changes proposed to reduce contact damage include a requirement for

- all pipeline licensees to subscribe to the Alberta One-Call service,
- all licensed pipelines to be registered with Alberta One-Call,
- anyone proposing to start ground disturbance near a pipeline to contact Alberta One-Call prior to conducting the ground disturbance to advise the licensee of the work and to request the licensee to mark the location of the pipeline, and
- the licensee's authorized on-site supervisor to have completed a certified ground disturbance supervision training course.

EUB Action

- The *Pipeline Regulation* changes are in the process of being finalized. If approved, the regulation changes will come into effect in 2004.

5.6 Public Complaints Associated with Pipeline Operations

There were 45 complaints associated with pipeline operations. The majority were a result of odours and spills from pipeline failures or venting of gas at pigging facilities and pipeline terminals.

6 Environment

6.1 Introduction

One of the EUB's primary responsibilities is to reduce the impacts of oil and gas activities on the environment. EUB field staff work with other government agencies and industry to minimize the environmental impacts from upstream petroleum industry operations. EUB field staff respond to public complaints and inspect oil and saltwater spills, drilling waste disposal operations, and waste management facilities, in addition to rigs, pipelines, and production facilities.

Field Surveillance operates two mobile air monitoring units that support our inspection activities at facilities where fugitive emissions are suspected.

6.2 Spills and Releases

6.2.1 Spill and Release Statistics and Inspections

A key goal of the EUB is to minimize the adverse effects of upstream petroleum industry releases regardless of where or when they occur. To ensure the most efficient and effective response, Alberta Environment (AENV) and the EUB developed *IL 98-1: A Memorandum of Understanding Between Alberta Environmental Protection and the Alberta Energy and Utilities Board Regarding Coordination of Release Notification Requirements and Subsequent Regulatory Response*. Releases are a loss of upstream product (gas or liquid) from its normal containment or transportation device, such as a tank, wellhead, truck, or pipeline. Spills are the liquid that must be recovered and cleaned up in accordance with EUB requirements.

In addition to reducing the number of spills and gas releases, minimizing their effects is also a priority. To accomplish this, licensees must ensure that

- their staff are provided with appropriate training,

- the source of the release is stopped,
- the spill is contained,
- the free fluids are recovered, and
- the spill site is remediated in accordance with AENV guidelines.

Releases are prioritized to allow for an appropriate, timely, and effective response by EUB staff.

- Priority 1 releases are those that pose the most serious environmental and public impact. EUB field staff make every attempt to immediately respond to the location; however, when that is not possible, all attempts are made to have another regulatory agency respond for the initial assessment. In these cases, EUB staff conduct an inspection as soon as possible.

- Priority 2 releases are those where a significant volume has been released or the impact on the environment is a concern. They may include low-volume releases if the licensee is new or has a poor inspection history. These sites are generally inspected within 7 working days.

- Priority 3 releases are low-volume but may include medium-volume releases if the licensee has a satisfactory inspection history. In these cases, EUB staff have a high degree of confidence that the release will be appropriately handled. Historically, about 25 per cent of priority 3 spills are inspected to ensure that they are satisfactorily addressed. In 2003, 26 per cent of priority 3 spills were inspected. This compares to 19.3 per cent of the priority 3 spills in 2002.

In 2003, Field Surveillance implemented a new computer database that enhanced the criteria used to prioritize releases. As a result, more scrutiny is provided for all releases. The priority of a release is calculated by the following criteria:

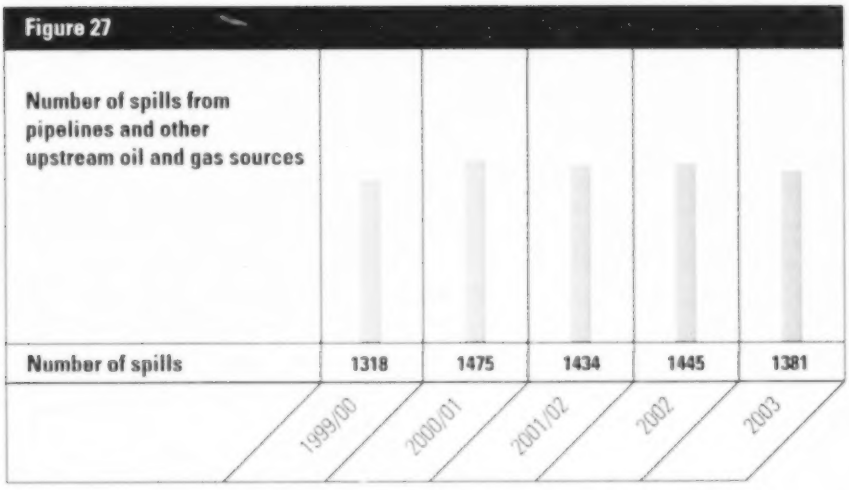
- on-lease or off-lease spill,
- area sensitivity,
- whether release is sweet or contains H_2S,
- type of area affected,
- environment affected,
- wildlife/livestock affected, and
- affected public.

A comparison of the annual number of spills since 1999/2000 is provided in Figure 27. As shown, a total of 1381 spills were reported to the EUB's eight Field Centres in 2003, a decrease from 1445 in 2002. Of the 1381 spills:

- 57 were priority 1 (4.1 per cent),
- 264 were priority 2 (19.1 per cent), and
- 1060 were priority 3 (76.8 per cent).

The number of spills decreased slightly and could be further reduced if industry improved maintenance and pipeline corrosion control programs. The EUB continues to work with industry towards these goals.

Figure 27



It is important to note that more than three-quarters of all spills were low volume and were usually contained on lease. Inspections were conducted on 506 spills. There were 474 satisfactory spill inspections, 12 minor unsatisfactory spill inspections, 20 major unsatisfactory spill inspections, and no serious unsatisfactory spill inspections (see Section 1.3 for definitions of satisfactory inspection and minor, major, and serious unsatisfactory inspections).

EUB Action

- EUB *Guide 55: Storage Requirements for the Upstream Petroleum Industry* was revised and published in December 2001. EUB staff monitor compliance with *Guide 55* to ensure that spills are confined to a small area and that the environmental impact is minimized. The EUB will continue to focus on industry's compliance with *Guide 55* in 2004.

6.2.2 Main Causes of Releases

Pipeline corrosion and equipment failure were the leading causes of liquid releases in 2003, consistent with causes found in 2002. Figure 28 shows the most significant sources and causes of releases and indicates that industry must become more effective with its preventive maintenance and corrosion control programs.

Figure 29 shows the volume of hydrocarbon and produced water spills over a five-year period. The spill volumes of hydrocarbon and produced water in 2003 were 5268.3 cubic metres (m^3) and 15 605.6 m^3 respectively. This is a slight increase in hydrocarbon volume from 5188.8 m^3 in 2002 and a significant decrease in produced water spilled from 19 164.8 m^3 in 2002.

6.2.3 Release Prevention

Spill response training exercises ensure that industry personnel are adequately trained to effectively respond to spills, thereby minimizing the impacts. There are 17 oil spill cooperatives throughout the province, 2 of which overlap into Saskatchewan and British Columbia.

Figure 28

Spills by source and failure type, 2003

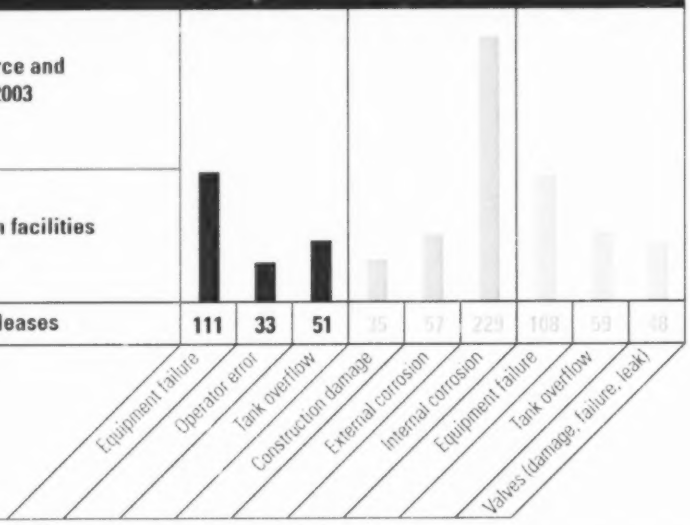
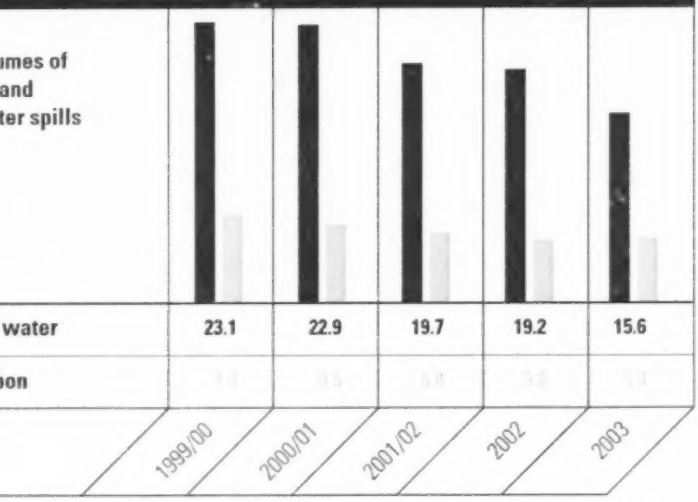


Figure 29

Reported volumes of hydrocarbon and produced water spills
(1000s of m³)



In 2003, EUB field staff participated in 14 of 17 oil spill cooperative training exercises and provided information on release statistics, release reporting requirements, and regulation change.

The EUB strongly supports the spill cooperatives and regularly participates with groups such as the Western Canadian Spill Services (WCSS) to enhance spill response preparedness throughout the province. Cooperative meetings and spill exercises provide EUB staff with the opportunity to communicate the importance of spill prevention.

EUB Action

- WCSS, Petroleum Industry Training Service (PITS), industry, and the EUB are working together to improve spill prevention programs. Spill response training will continue to improve industry response capabilities and reduce the environmental

impacts from spills. The focus in 2004 is to increase the number of adequately trained people in spill response and increase the participants' understanding, awareness, and ability. In addition, *Guide 71: Emergency Preparedness and Response Requirements for the Upstream Petroleum Industry* was published in June 2003. Its Section 7: Spill Response Contingency Plans is being enhanced to facilitate the above expectations.

6.3 Mobile Ambient Air Quality Monitoring

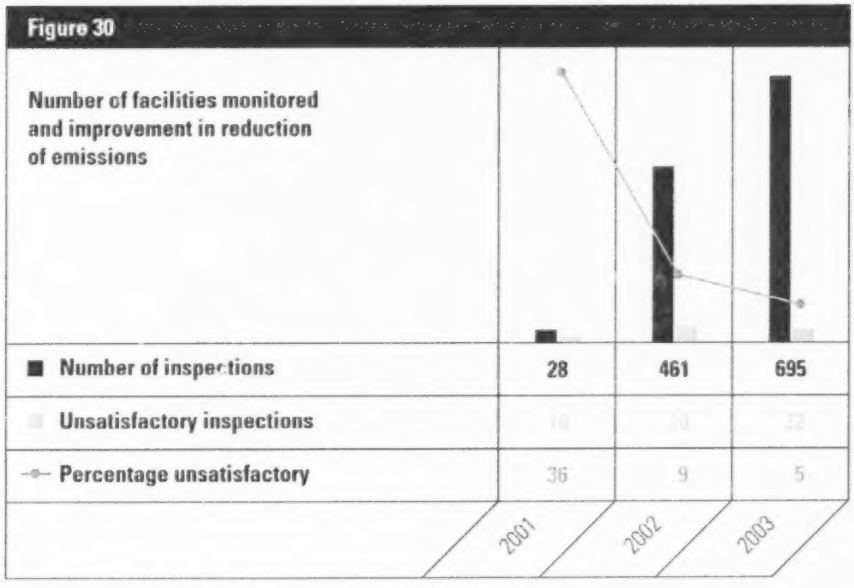
6.3.1 Monitoring Equipment

Field Surveillance has two ambient air monitoring units (AMUs) equipped with analyzers capable of reading and recording H_2S and SO_2 emissions in the parts per billion (ppb) range. In addition to the analyzers, the AMUs are capable of measuring and recording wind speed and wind direction. The EUB employs two dedicated air monitoring technicians to operate the units.

6.3.2 Routine and Complaint Response Monitoring

Field Surveillance uses its two air monitoring units to assist inspection staff in identifying facilities that emit fugitive emissions. In 2003, the two AMUs conducted mobile monitoring a total of 139 days, plus 9 days in stationary mode. The units were also used for 14 days to increase stakeholders' familiarity with and understanding of the EUB's air monitoring program. Figure 30 shows historical air monitoring results and industry's compliance record. Industry is improving its compliance record with respect to reducing emissions from oil and gas facilities. The leading sources of emissions were leaking tank hatches, tank truck loading and unloading, and inadequate maintenance.

Figure 30



In addition to conducting routine monitoring, responding to public complaints, and conducting stakeholder education and awareness, the AMUs are available to respond to emergencies. In 2003, the AMUs responded to two emergency situations.

6.4 Waste Management Initiatives

6.4.1 Waste Management Facilities

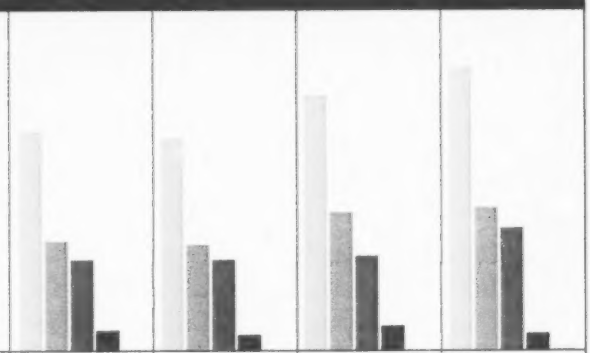
There are 69 active oilfield waste management facilities approved by the EUB. Waste management facilities, as described in *Guide 58: Oilfield Waste Management Requirements for the Upstream Petroleum Industry*, include

- waste storage facilities,
- waste transfer stations,
- waste processing facilities,
- surface facilities associated with waste disposal wells,
- waste disposal wells (classes 1a and 1b),
- caverns,
- landfills,
- biodegradation facilities, and
- thermal treatment facilities.

In 2003, field staff conducted 72 waste management inspections, resulting in 36 satisfactory inspections, 31 minor unsatisfactory inspections, 4 major unsatisfactory inspections, and 1 serious unsatisfactory inspection (see Figure 31). Off-lease odours, failure to meet *Guide 55* storage requirements, and staining/spillage were the most common deficiencies identified. All facilities were brought into compliance. This compares to 65 waste management inspections conducted in 2002.

Figure 31

Historical waste management facility inspections and results



	2000/01	2001/02	2002	2003
Number of inspections	56	54	65	72
Satisfactory inspections	28	27	35	36
Minor unsatisfactory inspections	23	23	24	31
Major unsatisfactory inspections	5	4	6	4
Serious unsatisfactory inspections				

The EUB Operations Section conducted 7 audits in 2003, which identified 5 minor deficiencies and 2 major deficiencies. All unsatisfactory facilities were brought into compliance. This compares to 15 audits conducted in 2002.

EUB Action

- The EUB will continue to meet with the Alberta Oilfield Treating and Disposal Association (AOTDA) to increase its members' understanding of the requirements and will focus on improving the compliance record of waste management facilities.

6.4.2 Drilling Waste Management

EUB *Guide 50: Drilling Waste Management* is the key document regulating drilling waste disposal. Two government agencies are responsible for regulating drilling waste management in Alberta:

- EUB, for private land, and
- Sustainable Resource Development, for public land (white and green areas).

Drilling waste disposal methods are identified in *Guide 50* as being either routine or nonroutine:

- routine—any disposal described in *Guide 50* that does not require preapproval (e.g., mix-bury-cover, landspray, landspray while drilling, and pump-off)
- nonroutine—any disposal described in *Guide 50* that requires preapproval (e.g., land treatment, biodegradation treatments, and alternative disposals)

In 2003, 12 nonroutine drilling waste sites were inspected. Of those, 8 had satisfactory inspections, 3 had minor unsatisfactory inspections, and 1 had a major unsatisfactory inspection. There were no serious unsatisfactory inspections. All of the unsatisfactory inspection items were brought into compliance. This compares to 2002, when 67 nonroutine drilling waste sites were inspected and 60 had satisfactory inspections, 6 had minor unsatisfactory inspections, and 1 had a major unsatisfactory inspection.

In 2003, 52 routine drilling waste disposal inspections were conducted. Of those, 30 had satisfactory inspections, 4 had minor unsatisfactory inspections, and 18 had major unsatisfactory inspections. There were no serious unsatisfactory inspections. This compares to 2002, when 110 routine drilling waste sites were inspected and 75 had satisfactory inspections, 17 had minor unsatisfactory inspections, and 18 had a major unsatisfactory inspections.

EUB Action

- *Guide 50: Drilling Waste Management* is currently under review; the new edition is scheduled for completion in 2004.
- In 2004, inspections will be increased for both nonroutine and routine drilling waste disposal to improve industry's compliance with *Guide 50*.